

Chapter 2 General Tools

FUNDAMENTALS

ELEMENT ATTRIBUTES

Setting Attributes

Every element placed in your MicroStation design file is placed with *Attributes*, including color, level, style, and weight. These are reflected in your **Attributes Tools Box** (Figure 2-1).

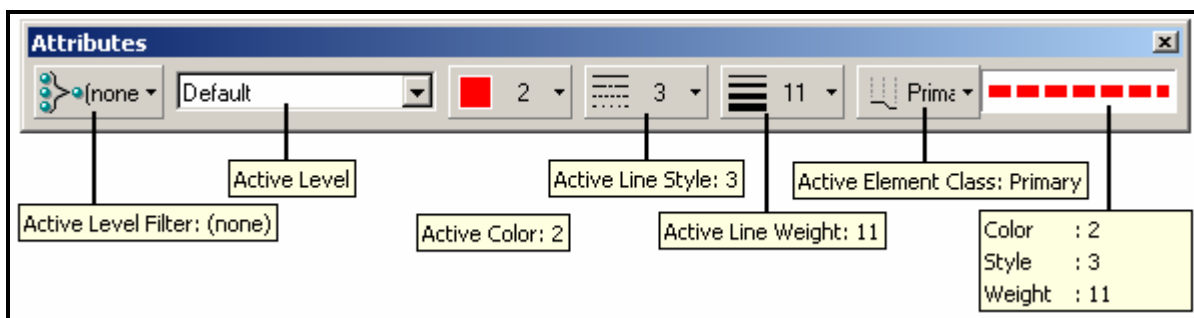


Figure 2-1: Attributes Tool Box

When you go to change an Element's Attributes, you can see these *Active Attributes*, along with another setting for your *Active Class* (Figure 2-2).

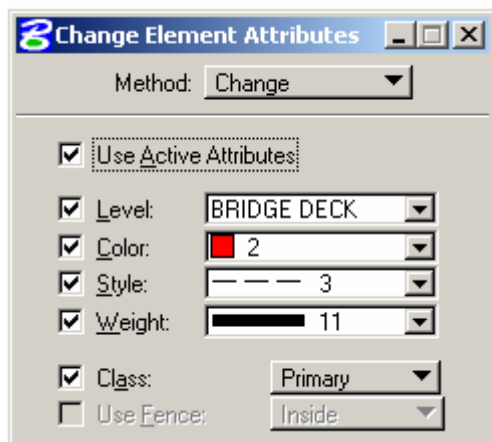


Figure 2-2: Change Element Attributes Setting

- 🎵 Element Attributes can be matched by changing the *Method* to *Match/Change*. Making elements *Class-Construction* is a way of marking “junk” lines in MicroStation as. This makes it easy to avoid plotting them. You can turn off the display of *Construction* elements from the **View Attributes** dialog (**Settings > View Attributes**).

Settings Manager

You can let the *Settings Manager* take care of all these *Element Attributes* for you.

For example, choose **Exist. Roadway Lines > Sidewalks** from the **plan.stg Settings Manager** (Figure 2-3).

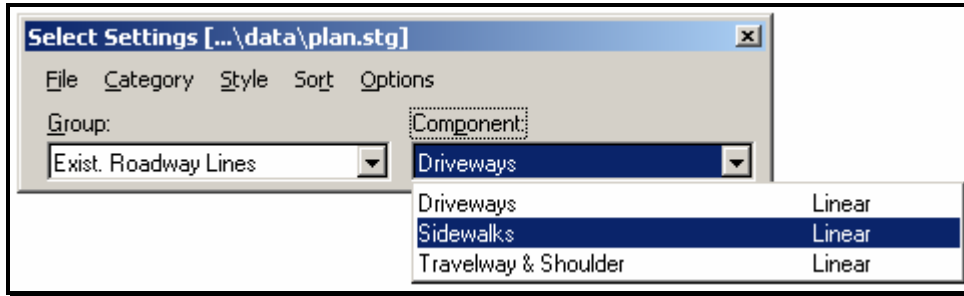


Figure 2-3: Pick a Component

This not only launches the *Smartline* command, it also sets your active color, style, weight and level for proper placement of existing sidewalk lines (Figure 2-4).

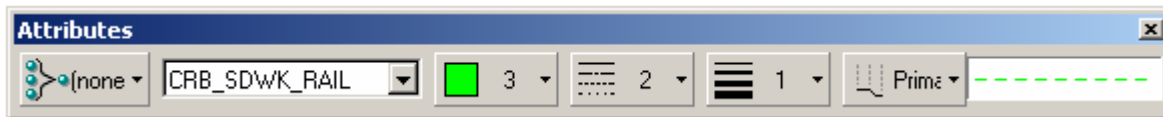


Figure 2-4: Sidewalk Setting

Level Display

The *Level Display* (Figure 2-5) can be launched from the main menu by selecting **Settings > Level > Display**, **Ctrl+E** or click the **Level Display** on the *Primary Tools* tool box.

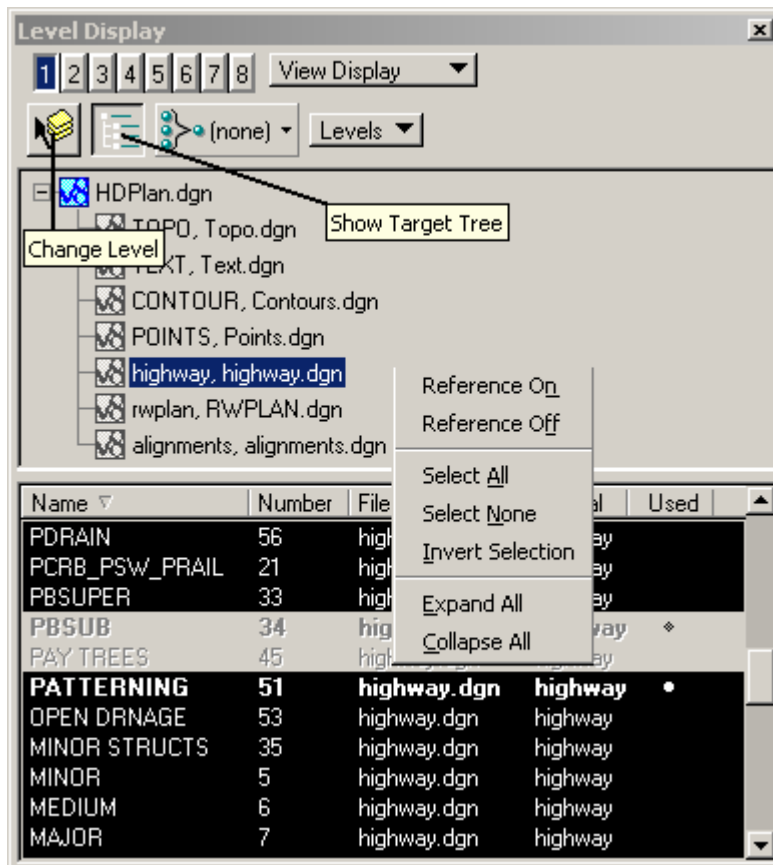


Figure 2-5: Level Display Dialog

mdot MicroStation

General Tools

This is a simple overview of some of the management options using the **Level Display**.

If the *Reference Files* or the active file is not displayed, **Click** on the + before the file, the **Show Target Tree** icon or **Right Click** and select **Expand All** from the menu to expand the file tree.

To toggle the display of levels in a file, **Click** a level if being used (white on black with a dot in the *Used* column) it will turn the level off and changes the white to black. If the level is off when clicked the change will be from black to white and turned on. All levels can be toggled by **Right Clicking** on a level and selecting **All On** or **All Off** from the menu. To turn off levels graphically, select the *Change Level* tool (Figure 2-5), in the *Level Display* dialog box, select the *Change Level* icon, choose **Level: Display Off** from the *Change Level Dialog* (Figure 2-6) and Data Hit the Element on the screen.



Figure 2-6: Change Level Dialog

The whole *Reference File* can be toggled by **Right Clicking** on the file and selecting **Reference On** or **Reference Off** from the menu.

Level Manager

The *Level Symbology* is now manipulated with the **Level Manager** (Figure 2-7). The *Level Manager* shown below does not display all of the columns available. By **Right Clicking** on the **Used** column header a menu appears showing other unchecked columns available. The *Level Manager* is displayed by clicking on the *Active Level* on the **Status Bar**, **Ctrl+L** or the *Level Manager* icon on the *Primary Tool Box*.

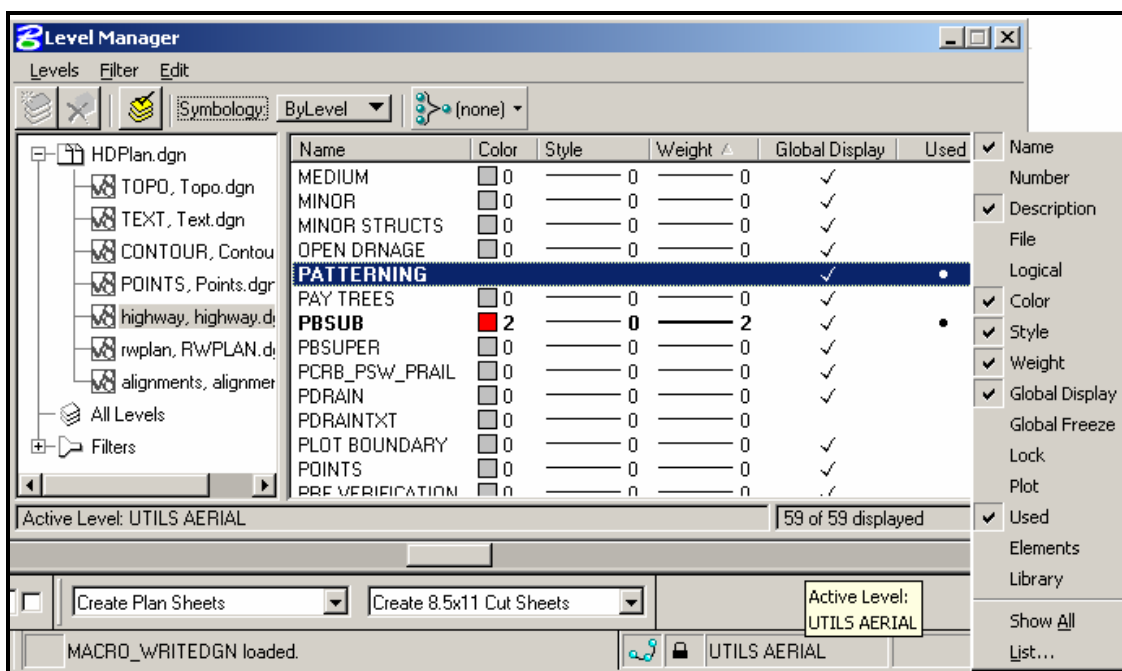


Figure 2-7: Level Manager Dialog

Most of our element symbology is set using the *Settings Manager* dialog. On occasion for viewing or plotting color, weight, or style needs to be manipulated without make actual changes to the element symbology. If necessary the *File Tree* can be expanded by clicking on the + beside the *Active File* in the *Level Manager Dialog*. Elements Symbology on every levels of each file can be changed by selecting the file on the left and the level from the right of the *Display Manager*. By clicking the checkmark in the Global Display column the graphic display of that level will be toggled on or off.

To use symbology by level switch the **Symbology** option to **ByLevel**. Click the desired Level Name, change the Color, Style and/or Weight and click **OK** to accept the change.

To override the symbology of a level switch the **Symbology** options to **Override**. **Right Click** on a level will bring up a menu with other options.

To view the symbology changes **Check** on **Level Symbology** and **Apply** in the *View Attributes* dialog (**Settings>View Attributes** or **Ctrl+B**). When the *Level Symbology* is uncheck the element attributes will return to normal.

SNAPS

Most of the elements placed are connected to previously placed elements. Snaps are use to accurately place points on a drawing. To tentative hit on an element **Snap Lock** has to be toggle on. To view the *Locks* (Figure 2-8) from the main menu **Settings>Locks>Full** or click the **Lock** on the *Status Bar* and select **Full**.

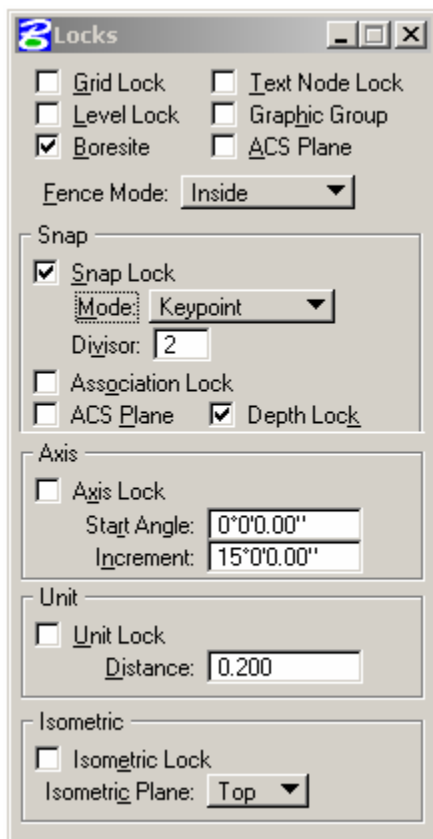

















Figure 2-8: Locks Dialog

A *Snap Mode* can be locked by changing the **Mode:** in the Snap field of the *Locks Dialog* or by holding down the **Shift** key and selecting the *Snap Mode* from the *Status Bar*. To use the snaps for one snap, use *Accudraw* shortcuts for some or select the snap from the *Status Bar*. For a complete list of *Accudraw* shortcuts, click in the *AccuDraw* and type “?” (**Shift+?**). To view all the available *Snap Modes*: **Settings>Snaps>Button Bar** or click the Snap Mode on the *Status Bar* and select **Button Bar**. Right Click on one of the icons on the *Snap Mode Dialog* (Figure 2-9) and a menu of all the snap mode which can be toggled will appear.



Figure 2-9: Snap Mode Dialog

Below is view and brief description of the available snap modes.

-
-  **Toggles AccuSnap:** Turns AccuSnap on and off
 -  **Nearest:** A Point on the element nearest to the cursor .
 -  **Keypoint:** Locates an element keypoint: end, middle, center, etc. The snap most commonly used.
 -  **Midpoint:** Midpoint of an element
 -  **Center:** Center of circles, arcs, text, shapes, etc.
 -  **Origin:** Origin of a cell, text justification, similar to the *Center Snap*
 -  **Bisector:** Midpoint of an entire line string, multi-line, or complex chain, rather than to the midpoint of the closest segment.
 -  **Intersection:** Intersection of two elements.
 -  **Tangent:** Constrained to be tangent to an existing element.
 -  **Tangent From:** Tangent from the existing element at the tentative point.
 -  **Perpendicular:** Tangent to the existing element at the tentative point.
 -  **Perpendicular From:** Perpendicular from an existing element
 -  **Parallel:** A point parallel to an existing element
 -  **Through Point:** A point through which the line you are placing will pass through
 -  **Point on Snap:** A point along or extension of a element

AccuSnap

By hovering near a *Keypoint* of an element with the cursor **AccuSnap** will display that point, the element, the type, level name and allow a *Data Point* to be placed at that point without a *Tentative Snap* (Figure 2-10).

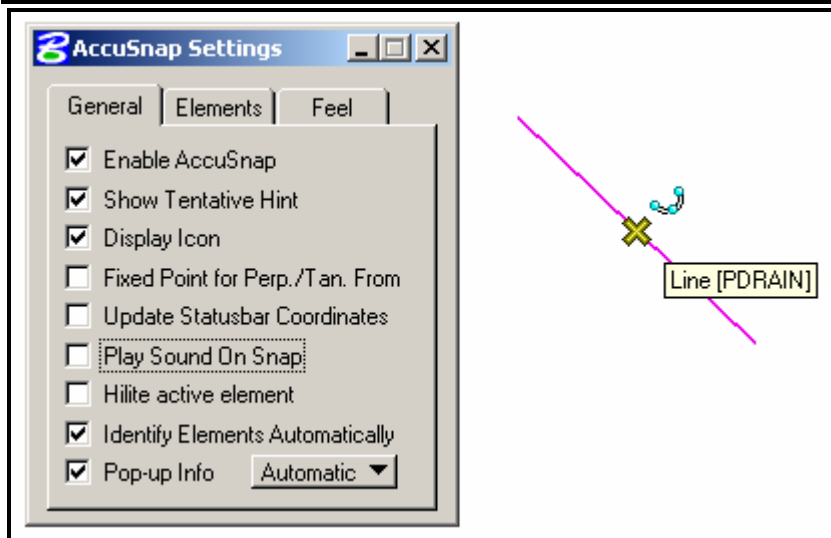


Figure 2-10: AccuSnap

AccuSnap can be toggled from the *Snap Mode Dialog* or the *AccuSnap Setting Dialog*. More settings are available with the *AccuSnap Setting Dialog* **Element** and **Feel** tabs.

Keypoint

Keypoint is used to snap to point on arcs or lines. The number of Keypoint on an element is set in the **Keypoint Snap Divisor Dialog** (Figure 2-11). The dialog can be open by typing **K** in your *Accudraw* Window. The division can also be set from the main menu **Settings > Design File>Snaps**.

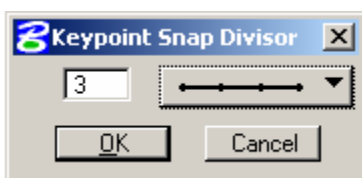


Figure 2-11: Keypoint Snap Divisor 3

Intersection

The *Intersection Snap* is used to locate the intersection of two elements. Locate one of the elements with a tentative snap which will highlight the element and just hover over the intersecting element with the curser and accept with a data snap when the *AccuSnap* appears on the screen. If *AccuSnap* is toggled off two tentative snaps, one on each element and a data snap to accept the point will be needed. You can continue snapping until the desired intersection is found; the last two tentative snaps define where the intersection point lies.

If the two elements do not actually intersect a point will be a projection where of one or both elements would intersect.

Center

The center snap can be used to snap to the center of a line, shape, circle, cell, etc. It requires one tentative. The tentative has to be placed on the *outside* of the shape – *do not* try to eyeball it and snap near the middle. (Eyeballing actually will work with circles, but not

with other shapes.) If *AccuSnap* is on, hover near the element and data hit when the *AccuSnap* appears.

Nearest

The nearest snap is used when you absolutely, positively have to get a point on an element, but you don't care (or don't know) exactly which point.

VIEW CONTROL

Overview

There are a number of view controls that you will use on a daily basis. You might want to edit your Function Keys to give you quick access to them. They include Zooming, Fit View, View Previous and View Next.

More Advanced view controls deserve another look.

Rotate View

Choosing the **Rotate View** (Figure 2-12) command gives you a number of choices.

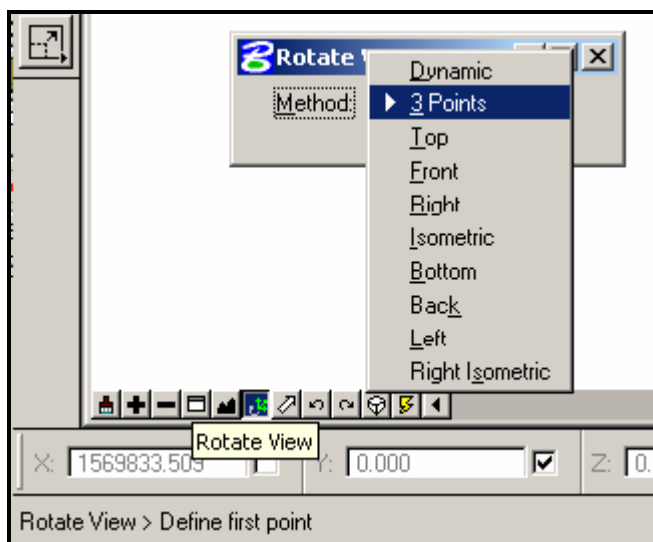


Figure 2-12: View Rotation Methods

The majority of these **Methods** relate to 3D view control. Remember that **Top** view is the default and always a safe starting point.

3 Points is the method of choice for rotating a view to something other than the default. The 3 points that you enter correspond to an xy axis. The first point is xy of zero (the coordinate origin). The second point defines the direction of the positive x-axis. The final point defines the direction of the positive y-axis.

♪ It is beneficial to have depth lock turned on for this operation.

3D Troubleshooting

Sometimes you will get unexpected results when you are working with 3D files. There are a couple of tricks that you can try out.

Flattening is always a good start.

Also make sure to rotate your view to “top.”

COMPLEX CHAINS AND SHAPES

Overview

Adjacent lines and arcs can be grouped together into *Complex Chains* and *Shapes*.

Creating Complex Chains

Use the **Create Complex Chain** tool to combine adjacent lines and/or arcs into a linear (non-closed) element.

- ♪ This allows you to measure length and construct distances along the combined element. It also speeds up modification and manipulation.

Activate the **Create Complex Chain** tool either from your **Main Tool Frame** (Figure 2-13) or from your main menu by selecting **Group > Groupings > Create Chain**.

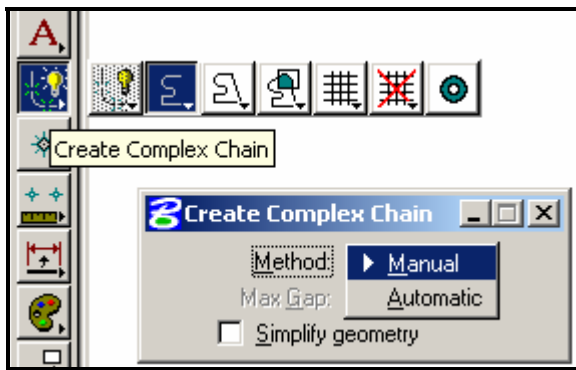


Figure 2-13: Create Chain

Using the **Manual** option, MicroStation prompts you to “Create Complex Chain > Identify Element.” Pick each element you’d like to add to the chain, in order, until you have selected the entire chain.

- ❗ **Make sure to Accept the final element in the chain.**

Reset to complete the chain.

Using the Automatic option, MicroStation will prompt you to “Automatic Create Complex Chain > Identify Element.” Once you have picked that element, just *Data Point* to *Accept* it and MicroStation will automatically highlight the next element in the chain.

- ♪ MicroStation will jump gaps to complete these chains. Set the **Max Gap** value to tell it how far to look.

Keep *Accepting* until MicroStation completes the *Chain*.

If there is a fork in the path, MicroStation will highlight one possible path and prompt you with the statement “FORK – Accept or reset to See Alternative.” Send a *Reset* if you don’t like the path MicroStation has chosen.

Creating Complex Shapes

Use **Create Complex Shape** to combine adjacent lines and/or arcs into a closed (non-linear) shape.

- ♪ This allows you to measure length and area and construct distances along the element. You can also fill, pattern, or hatch the resultant area. It also speeds up manipulation and modification of the element.

Choose **Create Complex Shape** from the **Main Tool Frame** (Figure 2-14) or choose **Group > Groupings > Create Shape** from your main menu.

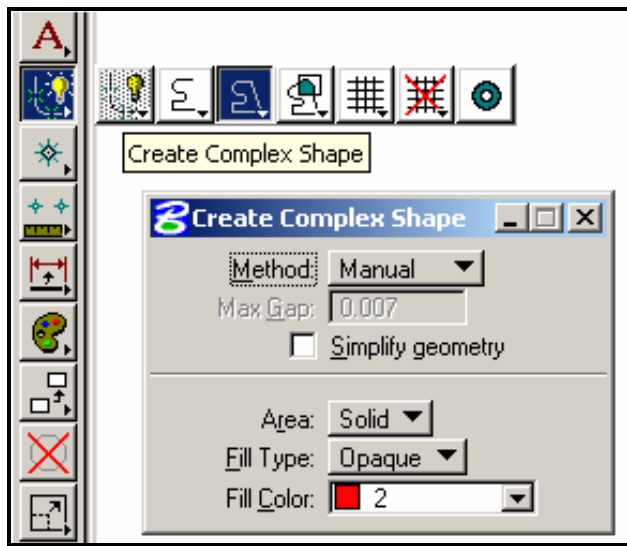


Figure 2-14: Create Complex Shape

Note that you have some of the same options here that you had in the **Create Complex Chain Tool Settings Window**.

Manual and **Automatic** creation procedures are much the same for **Shapes** as they are for **Chains**.

One notable difference is the fact that **Shapes** are only complete when they are closed. As soon as a **Shape** is closed by **Manual** or **Automatic** creation, the creation is immediately completed.

- ♪ If the end of the final segment does not correspond to the beginning of the first segment, MicroStation will draw a line that makes that connection.

Area

There are two choices for **Area** when you are creating a **Complex Shape**. They are **Solid** and **Hole**.

- ♪ This property is *only* relevant to *Hatching*. **Hole** elements cannot contain *Hatching* or *Patterning* elements.

It is strongly recommended that you do not ever place **Hole** elements in your drawing. It only leads to unnecessary confusion.

Fill Type

If you would like your resultant **Shape** to be either **Outlined** or **Opaque** you can make that selection here before you create the **Shape**.

Troubleshooting

Creating *Complex Chains* and *Shapes* is a fussy business: sometimes just a slight error can lead to unexpected results.

Extra Elements

Probably the most common mistake in creating *Complex* elements happens when the user *Resets* before the element is entirely finished. They realize they haven't created the entire *Chain*, and they go back to the beginning and re-create it.

The problem with this is that even though the first chain wasn't complete, it is still a legitimate element and MicroStation doesn't know that the user doesn't want it.

This ends up leaving all kinds of partial chains kicking around in your file.

♪ As a rule of thumb, don't forget to **Undo** your aborted efforts at creating *Chains* and *Shapes* before you go back and do it again.

COMPLEX REGIONS

Overview

While *Complex Chains* and *Shapes* are created by combining single, entire, simple elements, *Complex Regions* are *Closed* elements created through a more complicated interaction of multiple and potentially complex elements.

Launching the Tool

Choose **Create Complex Region** from your **Main Tool Frame** (Figure 2-15) or from your menu by choosing **Group > Groupings > Create Region**.

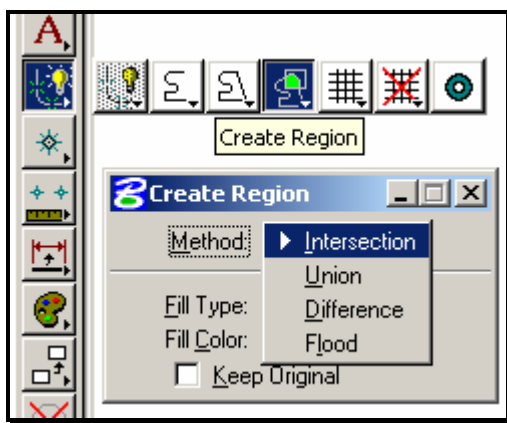


Figure 2-15: Create Complex Region

Complex Region Methods

In your **Tool Settings Window** you have four **Methods** to choose from. Starting from the circles and line in Figure 2-16, these four methods have the following effect:

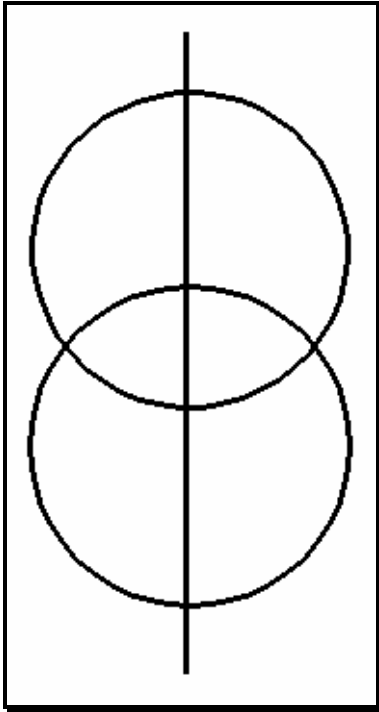


Figure 2-16: Starting Point

Intersection

Intersection creates a *Complex Region* out of the area where the two shapes overlap.

Choosing the two circles, the **Intersection** looks like Figure 2-17.

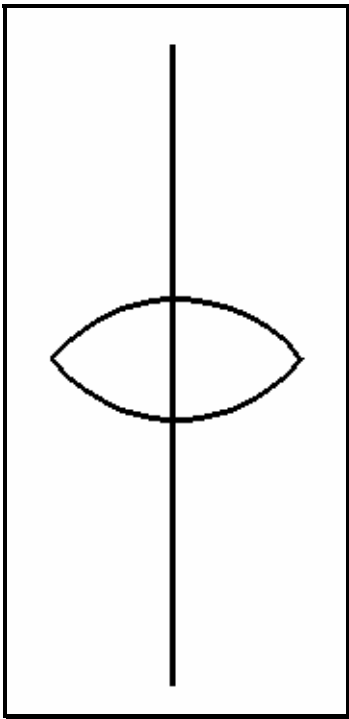


Figure 2-17: Intersection

Union

Union creates a *Complex Region* out of the outermost boundary of the shapes chosen.

Choosing the two circles, the **Union** looks like Figure 2-18.

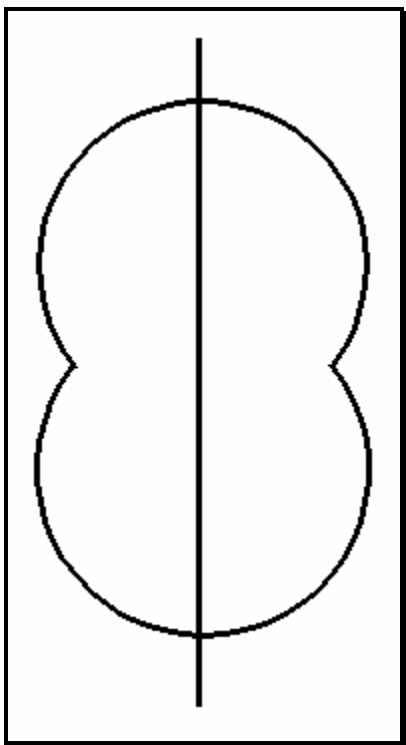


Figure 2-18: Union

Difference

Difference creates a *Region* that is the outside of the first chosen element, minus the outline of the subsequently chosen shapes.

Choosing first the top circle, then the bottom, the **Difference** looks like Figure 2-19.

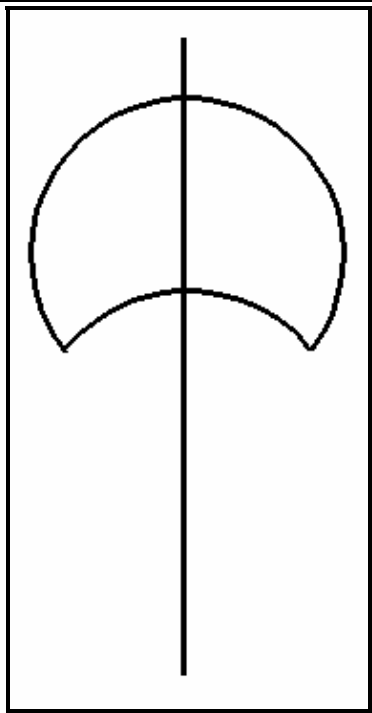


Figure 2-19: Difference

Flood

Flood defines an area by searching for enclosing elements around a *Data Point* sent by the user.

Sending a *Data Point* into the right side of the area where the two circles overlap looks like Figure 2-20.

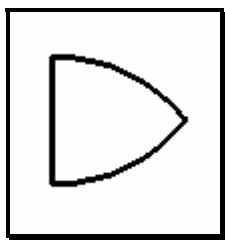


Figure 2-20: Flood

Fill

Note you have the same **Fill** options with *Create Complex Region* that you had with *Create Complex Shape*.

Keep Original

The examples above show the behavior of **Create Complex Region** with **Keep Original** disabled. Every element that contributes a piece to the resultant *Region* is deleted.

If you do not want these elements deleted, enable **Keep Original** from the **Tool Settings Window** (Figure 2-21).

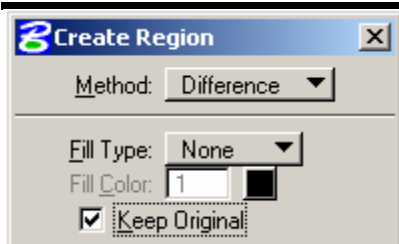


Figure 2-21: Keep Original

Tips and Tricks for Flood

In congested areas on the drawing, it is sometimes difficult to use the **Flood Method**. Often, MicroStation will not find the correct *Enclosing Region*.

To direct MicroStation to **Flood** the appropriate area, start by *PowerSelecting* only those elements you want MicroStation to consider in its **Flood** calculation.

INTRODUCTION TO THE SETTINGS MANAGER

The *Settings Manager* is our one-stop-shopping for establishing standard MicroStation procedures and properties. We are going to use it to develop everything from standardizing text height to launching macros.

STRUCTURE OF THE SETTINGS MANAGER

The *Settings Manager* works kind of like a menu structure: it has *Groups* and *Components*. Groups are like menus and Components are like the items on the menus. Picking a *Group* without picking a *Component* is kind of like opening up a menu without selecting an item: nothing happens. Think of the *Components* as buttons that need to be pushed to make something happen. When you haven't picked a *Component*, you haven't really *done* anything. *Settings Managers* are used to place elements on the proper level with correct weight, style and scale.

The Many Faces of the Settings Manager

One of the most confusing aspects of the *Settings Manager* is that it can take on a couple of very distinct appearances. Figure 2-22 shows what the *Settings Manager* looks like as a **Large Dialog**.

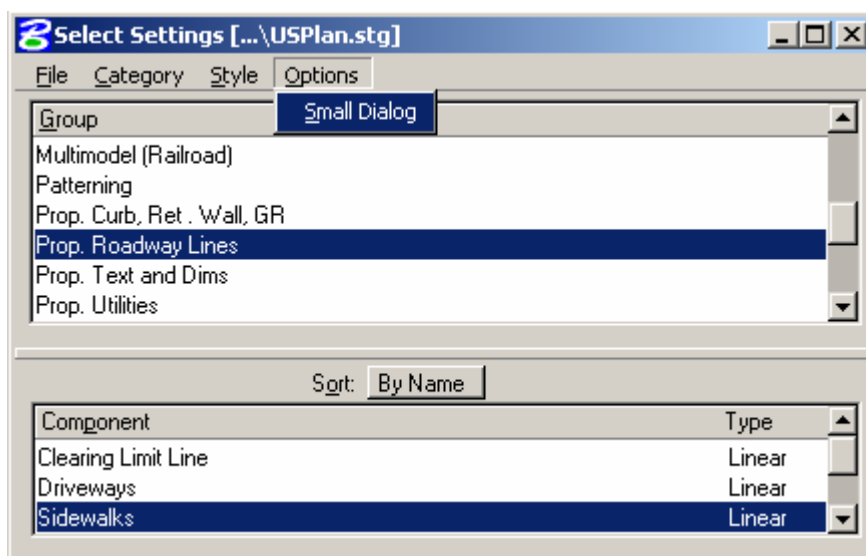


Figure 2-22: Settings Manager Options

This **Large Dialog** can be resized into the **Small Dialog** by choosing **Options > Small Dialog** from the Select Settings dialog. This will transform the **Settings Manager** to look like Figure 2-23.

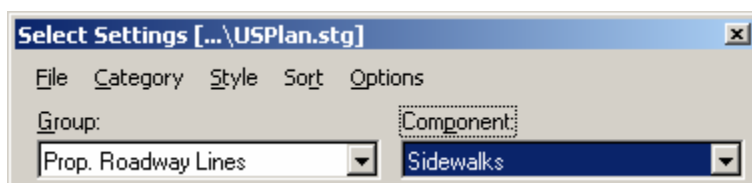


Figure 2-23: Small Settings Manager Dialog

From here, we can choose **Options > Large Dialog** to return to the large dialog, or we can pick **Options > Hide Menu Bar** to make the dialog even smaller (Figure 2-24).



Figure 2-24: Even Smaller Settings Manager Dialog

When the menu bars have been hidden, the only way to use an item on the menu is by right-clicking on the **Settings Manager**. This gives you the same options that were previously available from the **Select Settings** dialog's menu (Figure 2-25).

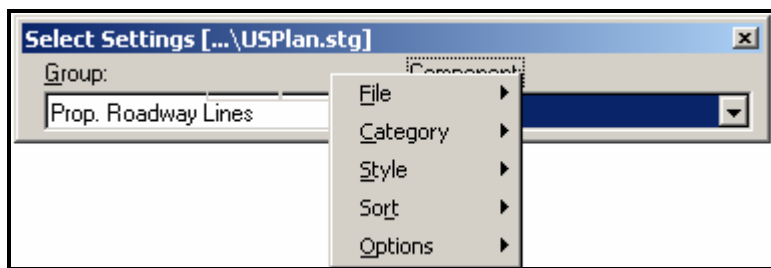


Figure 2-25: Right-click for Menus

The *Settings Manager* can be docked when in *Small Dialog* mode (Figure 2-26). The usual location for the *Settings Manager* is at the bottom. It is a user preference and is reloaded to the same location as when *MicroStation* is closed.



Figure 2-26: Docked Settings Manager

Opening the Settings Manager

The *Settings Manager* is autoloaded depending on the work group and the working units of the file, if the file is opened using the *MicroStation Manager* and a *PIN* is selected. Task-specific *Settings Managers* can be launched from your main menu by selecting **Settings > DOTSetMgrs > [Task]** or **File > Open** from the *Settings Manager Dialog* and selecting the **.stg** from *Open Existing Settings File Dialog*.

SETTINGS MANAGER SCALE

One of the primary functions of the *Settings Manager* is to help us standardize text and dimension size. It can also help us make sure that our symbols and cells all come into our drawings at the right size. This is accomplished through careful manipulation of the **Settings Manager Scale**.

Real World Size Vs. Paper Size

There is some confusion over the concept of drawing “*One to one*” or “*Full Size*” and how that impacts the *scale* of the drawing. If you’re drawing *one to one*, how could you possibly have a *scale* applied? Isn’t everything *full size*?

The answer is “yes -- but there is more than one kind of *full size*.”

How is that possible?

I like the AutoCAD terminology for this: call the two sizes “Paper Space” and “Model Space.”

When you’re detailing up an abutment, you want to make sure that a 6 meter wing measures 6 meters on the drawing -- that’s “Model Space” -- your “Model” of the abutment measures the same size in your file that it will measure out in the field.

But what about when you want to annotate the abutment? You know that when you get your finished plot back from the printer you want your annotation text to be 3 millimeters high. But what does that 3 millimeters mean to your 6-meter wing? Nothing -- because those 3 millimeters are in “Paper Space” instead of “Model Space.”

So how do you reconcile the two? That’s where the **Setting Manager Scale** comes in.

Selecting a Scale

Right-click on your **Settings Manager** to open your options menu and select **Category > Scale** (Figure 2-27).

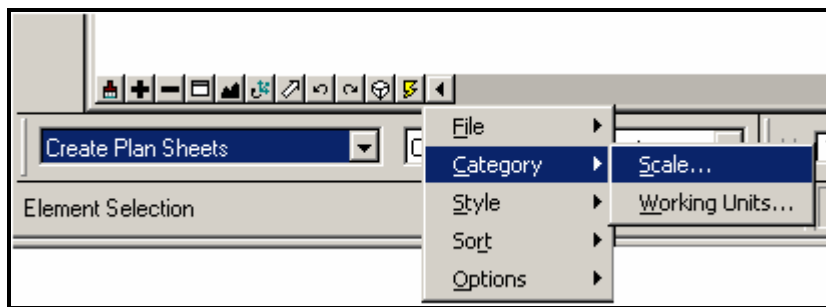


Figure 2-27: Right-click on the Settings Manager

This opens up the **Select Scale Dialog** (Figure 2-28).

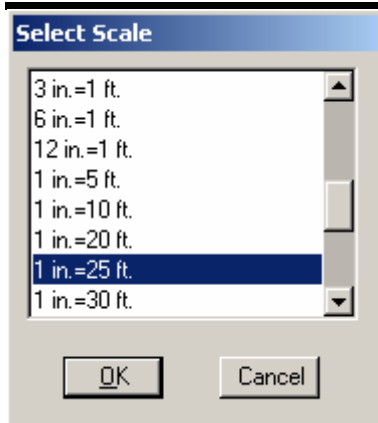


Figure 2-28: Select Scale Dialog

Let's say we select 1 in. = 25 ft. (1:300) as our scale.

What does this change?

What does this do for us? All this does is alert the *Settings Manager* to our intended plot scale. From here on out, anything that we launch from the *Settings Manager* is going to know that it needs to be at the selected scale. We'll see the impact of this when we use the *Settings Manager* to place text and dimensions, as well as certain cells, linestyles and borders. It does this by changing the text height or by setting the **Active Scale**. It does not change the size of elements in your drawing.

♪ Note again that this has no impact on items already placed in the drawing.

This is not at all like changing our *Working Units*. *Settings Manager* uses its internal scale settings only to help you place new text and cells at the right size. Once your text has been placed, you can do whatever you want to your *Settings Manager* scale and it will not impact the text on your drawing (however, as soon as you place more text by selecting **Text > Text Note** from the *Settings Manager*, it will set your text size to reflect your current *Settings Manager* Scale.)

SETTINGS MANAGER WORKING UNITS

Another thing that we are going to use *Settings Manager* for is to control our *Working Units* settings. This is going to help us to draw imperial details on a Metric sheet and vice versa.

① *A better way to accomplish this is to pick **Macros>Unit Swap (m<->')**. This toggles you from one set of working units to another (Feet to Meters).*

Choosing a Working Units Setup

From the **Settings Manager** choose **Category > Working Units...**(Figure 2-29)

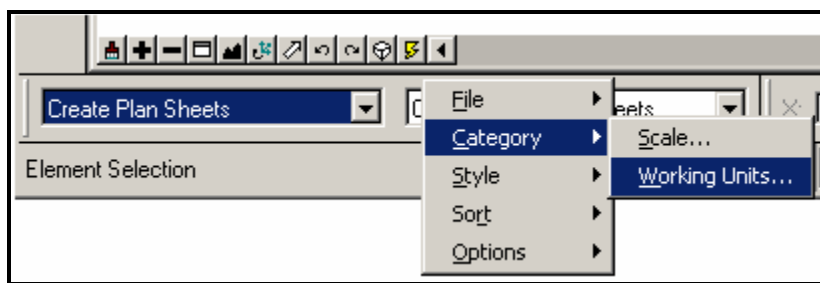


Figure 2-29: Category > Working Units

This will open up the **Select Working Units** dialog (Figure 2-30).

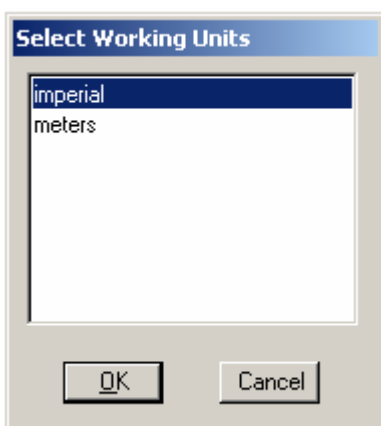


Figure 2-30: Select Working Units

The Defaults

All metric work should be done in **meters**.

All imperial work should be done in **imperial**.

All the other options are maintained only for backward compatibility.

Switching to U S Custom

If you are working in **meters** and you need to draw up an existing detail that is dimensioned in U S Custom units, you can switch your *Working Units* temporarily to **imperial**. Make sure to switch back to **meters** when you're done.

FENCES & GROUPS

SELECTION SETS

Select All

From your main menu, choose **Edit > Select All**. MicroStation will pick every element in your file.

❶ *Even elements that are not currently displayed will be selected. This includes construction elements and elements on levels that have been turned off.*

Select None

To clear a *Selection Set*, you can always choose **Edit > Select None** from your main menu.

Element Selection

The Element Selection tool (Figure 2-31) can be used to pick single or multiple elements for processing.

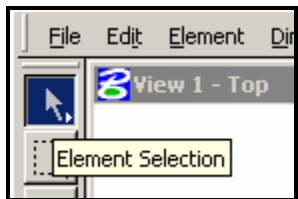


Figure 2-31: Element Selection

♪ Use of Element Selection changes the order in which you pick commands. Generally you pick your command first, then the element you want to affect. Using any element selection tool, you pick your elements first, then the command to alter them.

To select more than one element, hold down the **Ctrl** key when you click on new elements. If you select the wrong element, hold down the **Ctrl** key and click on it again to remove it from the *Selection Set*.

♪ Notice that when you add elements to a *Selection Set*, MicroStation displays the number of elements you have selected. This number is displayed in the right corner of your *Status Bar* as shown in Figure 2-32.

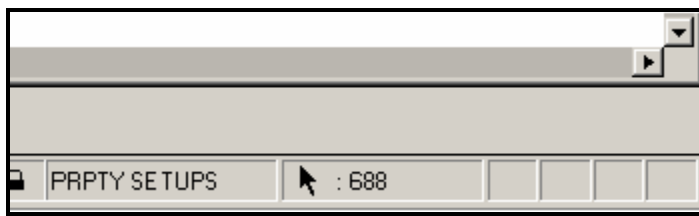


Figure 2-32: Count of Elements

To select elements over a wide area, click in empty space and drag. This will create a box. Elements entirely inside this box will be added to the *Selection Set*.

If you hold down **Ctrl + Shift** and drag the same box, it will add all elements overlapping the box to the *Selection Set*.

PowerSelector

The PowerSelector (Figure 2-33) is a more powerful way of quickly assembling *Selection Sets*.



Figure 2-33: PowerSelector

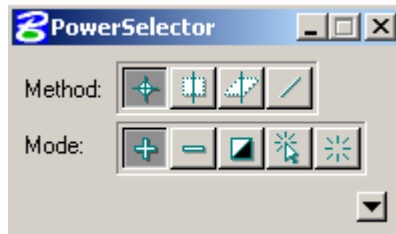


Figure 2-34: PowerSelector Tool Settings Window

The PowerSelector has a number of **Methods** and **Modes** of operation (Figure 2-34).

By changing **Methods** and **Modes**, elements can be added, subtracted, or inverted to a *Selection Set*.

Methods

By changing your **Method**, you can identify items singly, by block, shape or line.

Individual: selects graphically one element at a time

Block Inside: elements inside the block are selected

Block Overlap: overlapping elements plus those inside the block are selected

Shape Inside: elements inside a shape are selected

Shape Overlap: overlapping elements plus those inside a shape are selected

Line: selects elements that intersect a line

Modes

Add: adds elements to a selection set

Subtract: subtracts elements from a selection set

Invert: toggles the selection status of an element

New: clears the current selection set and starts a new set.

Clear/Select All: deselects all selected elements, or selects all elements if no elements are currently selected.

🎵 Block and Shape **Methods** can be switched from **Overlap** to **Inside** just by clicking again on the respective icon in the **Tool Settings Window**.

“Permanent” Grouping

Once you have elements gathered together into a *Selection Set*, you might want to “cement” them together.

With the elements selected, pick **Edit > Group**.

Notice that once you have grouped elements together, the number of elements in your *Selection Set* drops to “1”.

These elements have been joined together the same way elements of a cell are joined together. The only difference is that these “cells” don’t have cell names. MicroStation refers to them as *Orphan Cells*. They can be modified and manipulated exactly the same way cells are. To drop these *Orphan Cells* back to their original independent state, use the *Drop Complex* tool.

ADVANCED POWERSELECTOR

Setup

There is a little arrow in the lower right-hand corner of the *PowerSelector* Dialog (Figure 2-35).

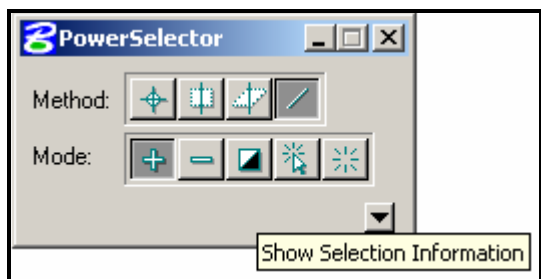


Figure 2-35: Show Selection Information

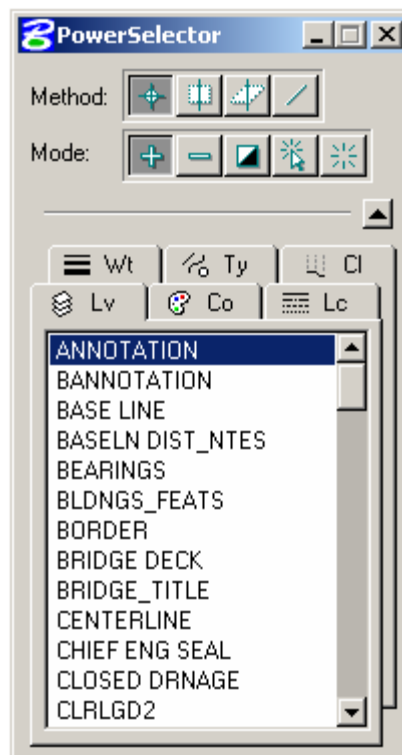


Figure 2-36: Expanded PowerSelector

To expand the *PowerSelector* click on the **Show Selection Information** arrow to reveal the Attribute tabs (Figure 2-36).

Tabs

Lv (Level): select levels from a list

Co (Color): select the required colors from a list (plus By Level).

Lc (Style): select the required line styles from a list (0–7 plus custom line styles present)

Wt (Weight): select the required line weights from a list (0–31 plus By Level).

Ty (Type): select the required element types from a list.

Cl (Class): select the required element classes from a list.

Adding Elements

Say you want to add all elements in a level to your *Selection Set*.

Start by choosing **Lv** tab from your **Tool Settings Window**.

Now **Click** the *Level Name* from the list of level names. Notice that the elements are highlighted and the level name moves to the top of the *Lv* list (Figure 2-37).



Figure 2-37: PowerSelector Lv Dialog

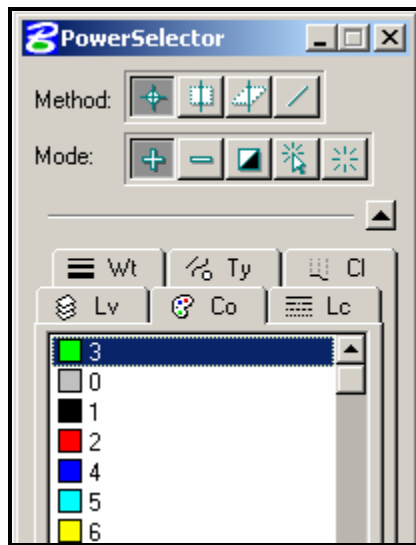


Figure 2-38: PowerSelector Co Dialog

All elements on **PAY TREES** level have been added to your *Selection Set*.

Now add all elements of color 2 to the set by choosing **Co tab** from the *PowerSelector*. Notice that *Color 3* is at the top of the list (Figure 2-38).

The *Color 3* is the color of elements already selected (elements on the PAY TREES level that was selected above from the *Lv* tab). To add color 2 to this list, **Click** the cursor in the “color 2”. Notice in (Figure 2-39) number 2 moved to the top with 3. All the elements with the color 2 have been added to the *Selection Set*.

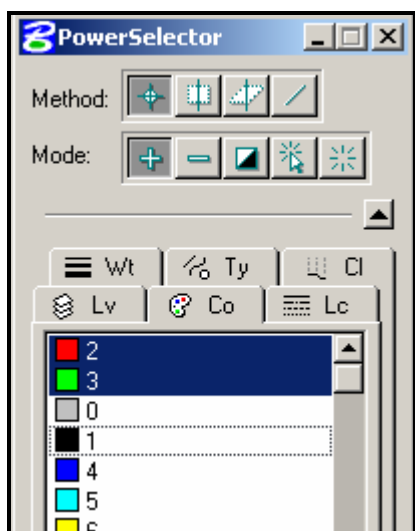


Figure 2-39: PowerSelector Co 2,3

❶ *This does not mean that all elements of color 2 and 3 are selected: it only means that there are elements of these colors in this Selection Set.*

Subtracting Elements

You can also use this feature to remove specific colors, levels, styles and weights from your selection set. Start by selecting all *Levels* that have elements, either by choosing **Edit > Select All** or by **Clicking** on the first level that is not high lighted and dragging to display all of the levels and release. Now check out the **Lv** tab, all the levels that are present in the *Selection Set* (Figure 2-40) have elements.

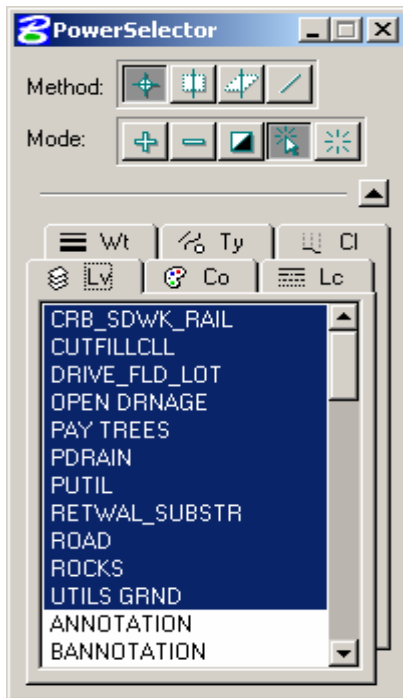


Figure 2-40: All Levels Picked

Clicking on the level name will remove all the elements on that level from the *Selection Set*.

Color, Style, Weight, Type and Class

By **Clicking** on the list from Color, Style, Weight, Type and Class tabs the elements can be manipulated the same way as the *Levels*.

SELECT BY ATTRIBUTES

Overview

Select By Attributes is an extremely useful tool for making focused alterations to a design file. You could use it to help accomplish any of the following:

Move all text to MINOR.

Delete all lines that are **Color 5** and **Weight 4**.

Change all elements on PBSUPER to be Construction elements.

The *Select By Attributes* tool allows you to specify certain *Element Criteria*. It then searches through the file and selects elements that match those search criteria.

The **Select By Attributes Dialog** (Figure 2-41) can be opened from the main menu by selecting **Edit > Select By Attributes**.

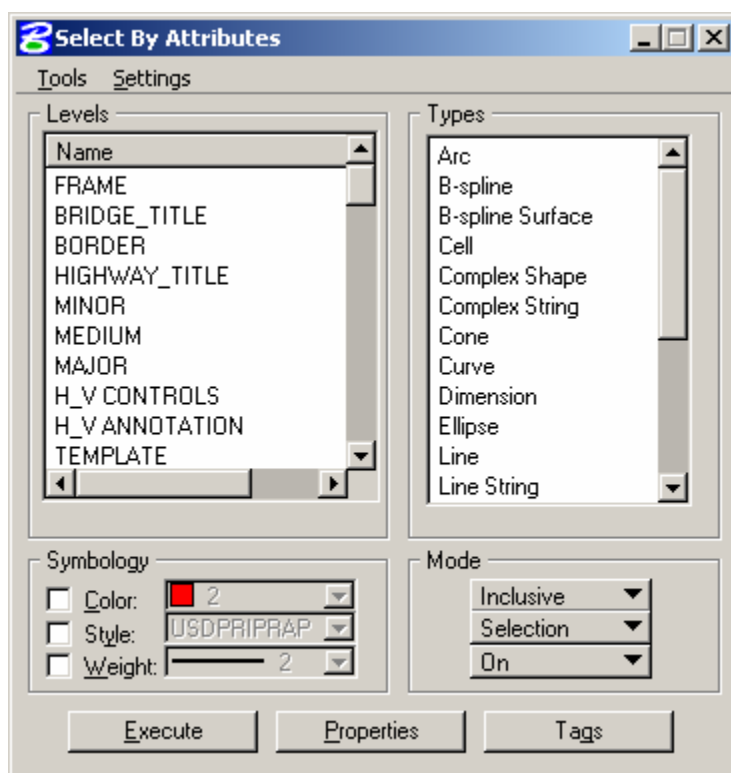


Figure 2-41: *Select By Attributes*

Standard Methods

The simplest application of the *Select By Attributes* tool uses the default settings.

In the **Levels**, **Symbology** and **Types** areas of the **Select By Attributes** dialog pick your search criteria. The example in (Figure 2-42) shows what the dialog would look like if you wanted to pick all text in levels **PRPTY ENVRN** and **RIGHT OF WAY** that is also of color **5**.

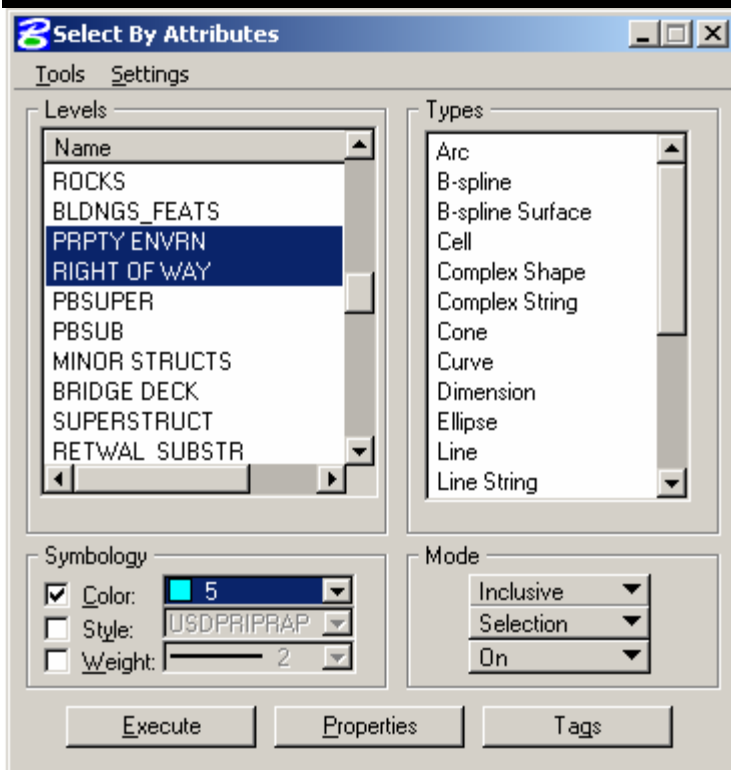


Figure 2-42: Select By Attributes Dialog

♪ Note that since **Style** and **Weight** are not selected, this process will identify elements of any style or weight.

Push the **Execute** button and MicroStation will add all elements that match these criteria to a *Selection Set*.

Element Type Hints

The **Types** of the **Select By Attributes Dialog** is not always straight forward. Here are a few hints that should make it easier to select the elements you want.

Multi-line text is **Text Node** type. Single-line text is the **Text** type. Typically, if you want one, you want both of them.

For circles, the **Type** you want to choose is **Ellipse**.

To pick Smartlines with arcs in them, choose the **Complex String** type.

Similarly, any closed area with arcs would be the **Complex Shape** type.

Smartlines without arcs are **Line Strings**.

All closed polygons (squares, triangles, rectangles, etc.) are **Shapes**.

Leaders placed by the *Place Multi-Line Note* tool are **Dimension** types.

Right Clicking in the Levels and Types fields Select By Attributes Dialog gives the option to *Select All, Select None or Invert Selection*.

Elements grouped together by selecting **Edit > Group** are **Cells**.

ADVANCED SELECT BY ATTRIBUTES

Overview

Up until now, we have only used the default **Mode** settings of the **Select by Attributes** tool. These are good enough to get you where you need to go 90% of the time. But there are a few things you might want to do that you'll need some extra help with. For example, you might want to:

Pick all elements except text.

Delete all color 5 lines from one part of your drawing.

Move all filled elements to level CENTERLINE.

Delete all text of font 24.

Modes

The first thing to look at is the **Modes** section of the **Select By Dialog**. There are two areas we'll focus on. The first allows you to select either **Inclusive** or **Exclusive** modes (Figure 2-43).

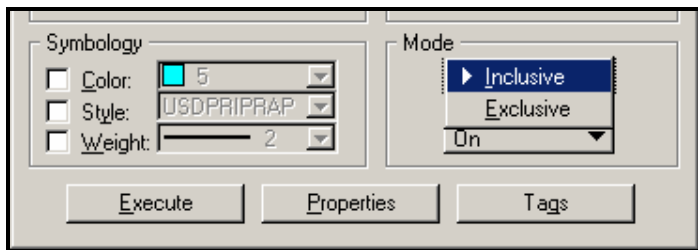


Figure 2-43: Inclusive/Exclusive

Inclusive, the default setting, means that all elements that match your criteria will be affected.

Exclusive means that all elements *except those* that match your element criteria will be selected.

♪ Therefore, to pick all elements except text, set your **Type** field to **Text** and **Text Node**, set your **Mode** to **Exclusive** and push **Execute**.

The other parts of the **Mode** allow you to choose how you want to act on the elements you have selected (Figure 2-44).

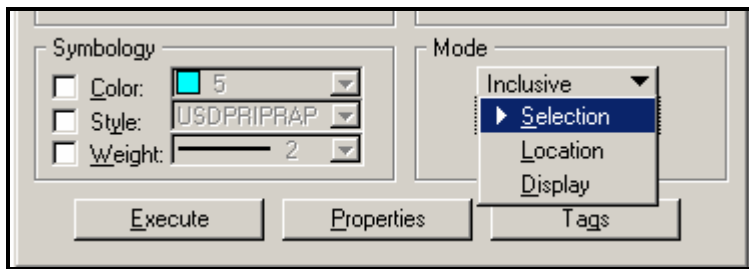


Figure 2-44: Selection/Location/Display

Selection, the default settings, adds the identified elements to a *Selection Set*.

Location allows you to “lock down” elements other than your identified elements. Only elements that match your criteria will be accessible to MicroStation commands. This will prevent you from copying, matching, or deleting any but your identified elements.

Display makes all other elements invisible. Only elements that match your criteria will show up on your window.

❗ *Using the Display mode will have minor adverse effects on “dynamic” displays. This means fences, selection sets and other “rubber-banding” affects may not display as you’d expect. All the tools still work as normal, though.*

Properties

At the bottom of the **Select By Attributes Dialog** you will find the **Properties** button (Figure 2-45).

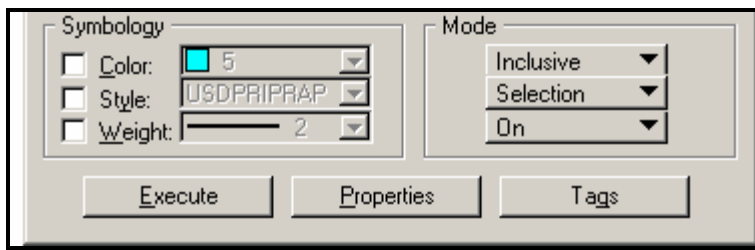


Figure 2-45: Properties

Pushing this button gives you access to more element selection criteria via the **Select By Properties Dialog** (Figure 2-46).

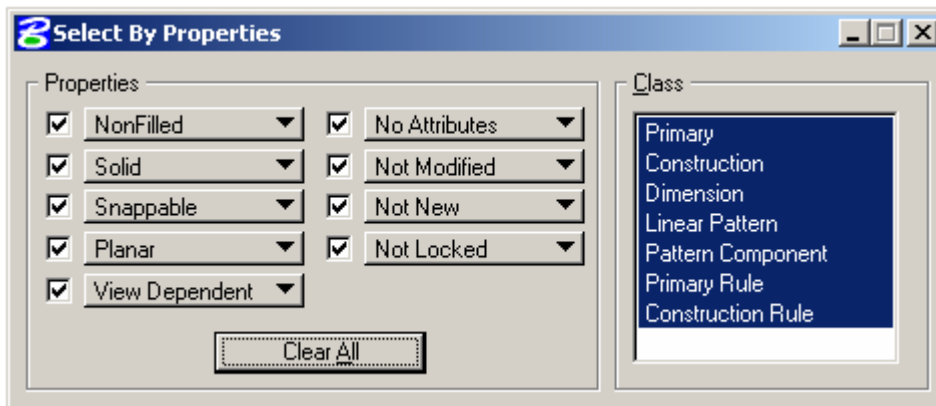


Figure 2-46: Select by Properties Dialog

Two parts of this dialog are likely to be useful to you.

From the **Properties** portion, you can place a **Check** next to the **Non-Filled** option and choose to select by whether or not an element is **Filled**.

From the **Class** area, you can select whether you want to pick **Construction** or **Dimension** elements.

- ♪ Even after you drop *Dimensions* into their component elements, those elements are still in the **Dimension Class** and can be selected together by the **Class** portion of the **Select By Properties Dialog**.

More Properties

From the **Select By Attributes Dialog**, you can open up four more dialogs that control settings for specific kinds of elements under the **Settings Menu** (Figure 2-47).

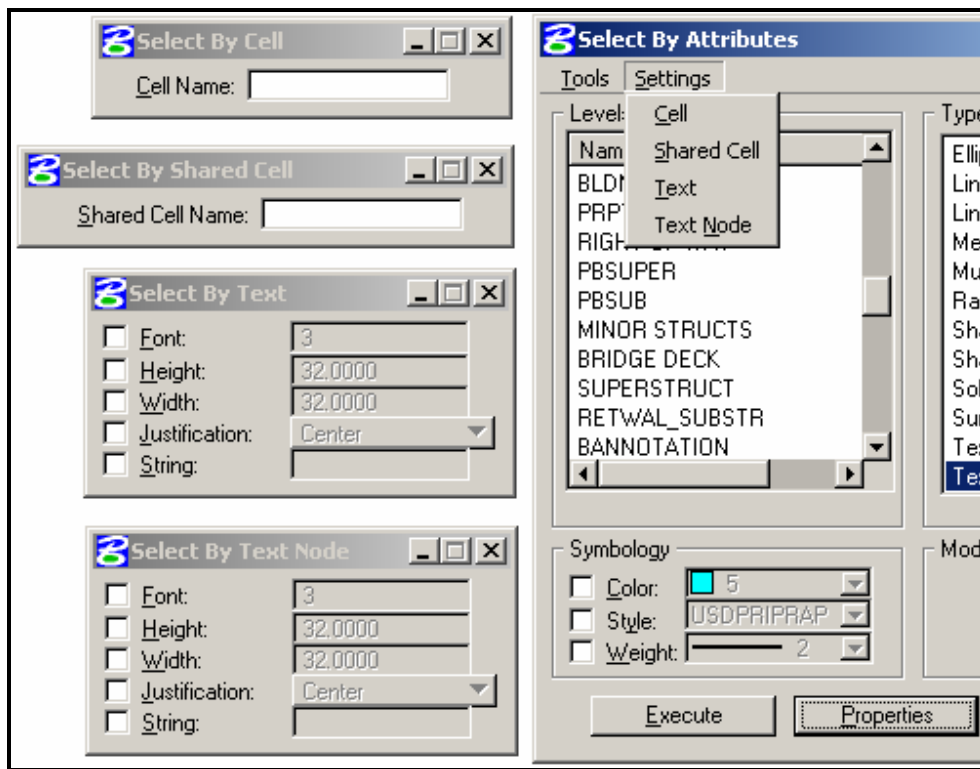


Figure 2-47: Settings Menu Properties

These options allow you to select cells and text by very specific element attributes.

Set Select By From Element

If you don't know exactly what attributes you want to select by, but you know of an element on your drawing that is an example of those criteria, you can choose **Tools > Set Select By From Element** from the **Select By Attributes Dialog Main Menu**.

This brings up the **Set Select By Dialog** (Figure 2-48).

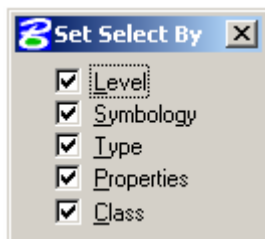


Figure 2-48: Set Select By

Toggle on or off each item on the dialog depending on whether you want to select based on that criteria, then identify the element in your file to match.

FENCES

Discussion

With all the capability of the Element Selection tools, you could ask if there is really any need for another way of grouping elements.

Fences are more of an old-fashioned way of working in MicroStation, and they are not as necessary for day-to-day drawing as they used to be.

There are, however, some important reasons to keep fences in your arsenal.

One is processing time. If you have to move a lot of elements, it is usually quicker to fence them than to select them. This is because the selection tools require more redrawing of the elements to the views.

Another reason to use fences is to clip elements by setting your *Fence Mode* to either *Clip* or *Void-Clip*.

A less common application would be to use the *Void* mode to process all elements outside the fence boundary.

Fence Types

When you choose the **Place Fence** tool (Figure 2-49) you have a number of options of what kind of *Fence* you would like to place (Figure 2-50).



Figure 2-49: Place Fence

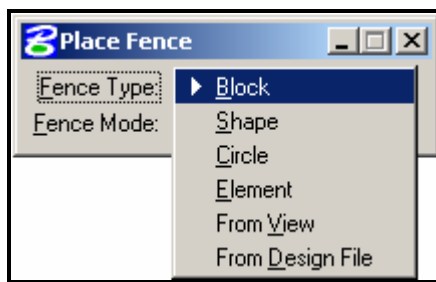


Figure 2-50: Fence Types

Block allows you to define two corner of a rectangle.

Shape allows you to define up to 101 vertices of a polygon.

Circle allows you to define a center and radius for a multi-vertex polygonal approximation of a circle.

❗ *This is not really a circle, but it's pretty close. Use it accordingly.*

Element allows you to pick an element. MicroStation will approximately overlap the Element's outline with a fence.

From View will place a fence that matches the view outline.

From Design File will pick all elements in the design file.

Fence Modes

Once you have placed a fence, you can change your **Fence Mode** to affect elements that are either **Inside** or outside your fence, **Overlapping** it or not, or even **Clipping** elements at the point that the fence crosses them (Figure 2-51).

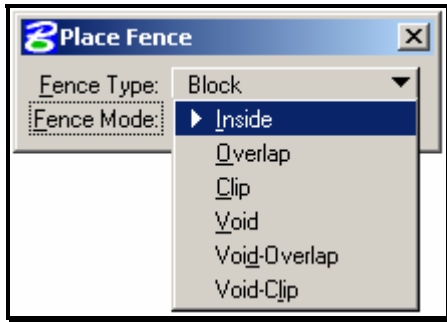


Figure 2-51: Fence Modes

Inside affects only elements entirely inside the fence.

Overlap affects elements with any part in the fence.

Clip affects all elements inside the fence, cutting elements where they cross the fence boundary.

Void affects all elements entirely outside the fence.

Void-Overlap affects all elements with any part outside the fence.

Void-Clip affects all elements outside the fence, cutting elements where they cross the fence boundary.

Points to Ponder

Area of Influence

Selection Sets specifically identify particular elements. No matter how you process them, you never will process elements other than the ones you initially selected. This is *not* the way *Fences* work.

Fences always affect the elements that lie within their selection area (bearing in mind your active *Fence Mode*.) Every time you move or copy a fence from one location to another, you are defining a new area of influence, and can potentially be picking up new elements to process.

3D Windowing

Fences in 3D files are view-specific.

❶ *Fences must be in your view at all times or they will be deactivated and you will need to place them again. Be careful when you zoom and pan.*

Deactivating Fences

The way to deactivate a fence is to choose the **Place Fence** tool. This immediately clears your active fence.

GRAPHIC GROUPS

Overview

① *Graphic Groups are common even if you don't create them yourself: they are often the by-product of translations or custom applications. Be aware of their functionality.*

Graphic Groups are yet another way to bunch elements together for quick processing. They are more like *Selection Sets* than fences, since they single out specific elements rather than affecting all elements in a specific are the way fences do.

Graphic Groups have one special capability: elements in *Graphic Groups* can be moved independently or simultaneously depending on the current status of your *Graphic Group Lock*.

Graphic Group Lock

Graphic Groups rely on the *Graphic Group Lock*. This can be toggled on and off from the **Locks** portion of your **Status Bar** (Figure 2-52).

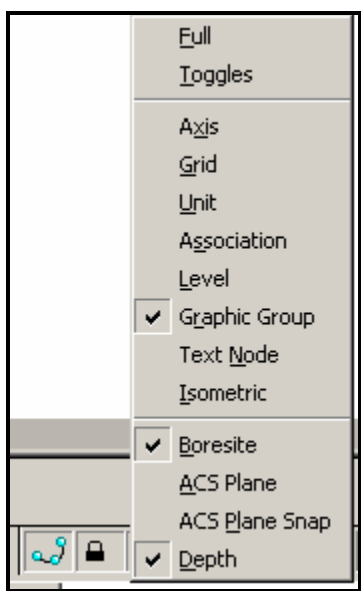


Figure 2-52: Locks in the Status Bar

When the *Graphic Group Lock* is turned on, all elements in the same *Graphic Group* are grouped together much like a single cell or *Selection Set*: they can be copied, rotated, moved or deleted as one.

However, when the *Graphic Group* lock is turned off, the elements are all affected completely independently of each other.

Adding Elements to a Graphic Group

Elements can be added to a graphic group either singly or by *Selection Set*.

To add elements one at a time, choose **Group > Groupings > Add to Graphic Group** from

your main menu, or pick the **Add to Graphic Group** tool from your **Main Tool Frame** (Figure 2-53).



Figure 2-53: Add to Graphic Group

Once the tool is activated, pick all the elements you'd like to add to the group.

To add a bunch of elements to a *Graphic Group*, add them to a *Selection Set* (by *PowerSelector*, for instance). Then choose the **Add to Graphic Group** command and *Data Point* to *Accept* the action.

Removing Elements from a Graphic Group

Graphic Groups can be dropped either singly or all at once. To drop elements from a *Graphic Group* one-at-a-time, make sure your *Graphic Group Lock* is turned off. Pick the **Drop from Graphic Group** command from your **Main Tool Frame** (Figure 2-54) or select **Group > Groupings > Drop from Graphic Group** from your menu.

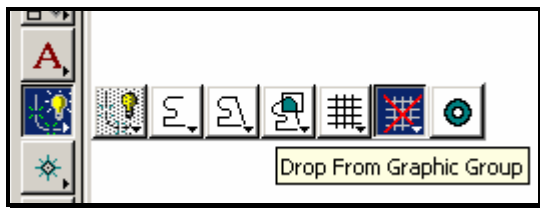


Figure 2-54: Drop from Graphic Group

Once you have chosen the tool, pick the elements you'd like to remove from the *Graphic Group*.

To drop an entire *Graphic Group*, follow the same routine as above, making sure that *Graphic Group Lock* is turned *on* instead of *off*.

Adding Elements to an Existing Graphic Group

You may want to add a couple of elements to an existing *Graphic Group*.

Choose the **Add to Graphic Group** tool. When it prompts you to "Add to Graphic Group > Identify Element" start by picking an element that is already in the *Graphic Group* you want to add to. Then go on to select the elements you would like to add to the *Graphic Group*.

ACCUDRAW

FUNDAMENTALS OF ACCUDRAW

✓ See page 2-51 for a detailed example of using Accudraw.

Introduction

Launch **Accudraw** from the **Primary Tools** toolbox by pressing the **Start Accudraw Button** (Figure 2-55).



Figure 2-55: Accudraw Start

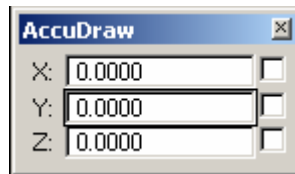


Figure 2-56: Rectangular Accudraw Window

Somewhere on your screen you'll see the Accudraw window (Figure 2-56).

The window may be in its *Distance/Angle* format as well (Figure 2-57).

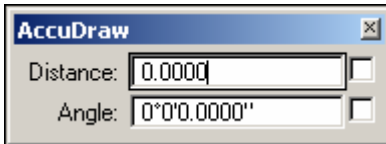


Figure 2-57: Polar Accudraw Window

It's also possible that the Accudraw window will be docked (Figure 2-58).



Figure 2-58: Docked Accudraw Window

When you place a data point in the drawing, it will bring up the *Accudraw Compass*. In Figure 2-59, you can see *Accudraw* in *Rectangular* mode.

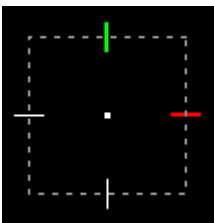


Figure 2-59: Accudraw's Rectangular Compass

🎵 Use the *Rectangular* mode to draw xyz distances as well as slopes expressed as xy.

In Figure 2-60 you can see *Accudraw* in its *Polar* mode.

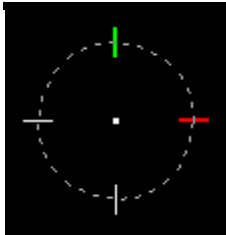


Figure 2-60: Accudraw's Polar Compass

♪ Use *Polar* mode to draw lines at a fixed angle or bearing.

Press your **[Spacebar]** key to toggle back and forth between distance and angle mode.

Shortcut Keys for Construction

O allows you to place the *Accudraw Compass* at a specific point without placing a *Datapoint*.

RQ allows you to spin the *Accudraw Compass*.

V rotates the *Accudraw Compass* to be aligned with the view.

A locks the angle in

X, Y and **Z** lock the corresponding *Accudraw Axis*.

[Enter] locks the *Accudraw Axis* along whatever axis the user is gesturing.

ACCUDRAW SETTINGS

You can access *Accudraw's* settings by typing **GS** into your *Accudraw Window* or from the *Main Menu Settings>AccuDraw*. This will bring up the **AccuDraw Settings Dialog** (Figure 2-61).

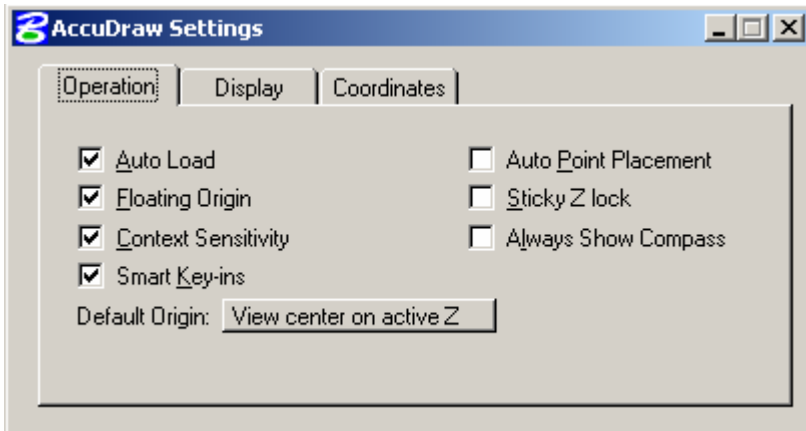


Figure 2-61: Accudraw Settings Dialog

Operation Tab

Auto Load: If on (the default), when MicroStation is started loads AccuDraw automatically

Floating Origin: If on (the default), the origin moves to the last point placed

Context Sensitivity: If on (the default), enables tools to provide “hints” to AccuDraw to override its default behavior for smoother operation

🎵 **Context Sensitivity** won't do anything without **Floating Origin** turned on.

Smart Key-ins: If on (the default), AccuDraw interprets a number as positive or negative, depending on the direction of the pointer from the compass. In rectangular mode only, causes AccuDraw to move the focus to either the x or the y field depending on pointer position.

Auto Point Placement: When on, places data points automatically when they have been fully constrained (default is off)

Sticky Z Lock: If on (default is off), when you lock the Z axis, for example, where you want to draw on the one plane (that is, you want to lock $Z=0$), while snapping to elements that are on another plane the Z value will remain locked until you turn it off.

Always Show Compass: If on (default is off), when is activate AccuDraw, the compass displays before placing a data point for the current operation.

Default Origin: Lets you choose the default origin. When a tool starts AccuDraw and there is no origin currently defined, then this setting specifies the default location of the AccuDraw drawing plane origin. Options are:

View Center on active Z: The AccuDraw's origin is centered in the view, at the Active Z depth

Global origin: The AccuDraw's origin at the Global Origin of the file

Global origin on active Z: The AccuDraw's origin at the Global Origin of the file and at the Active Z depth]

Display Tab

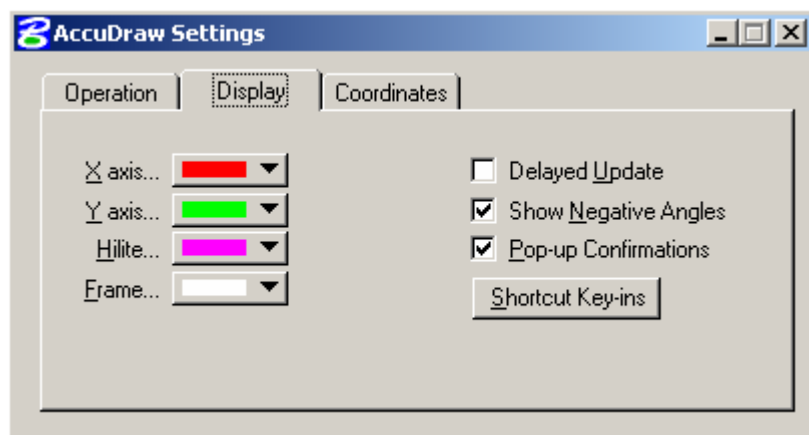


Figure 2-62: AccuDraw Settings Display Tab Dialog

X axis, Y axis, Hilite & Frame: The colors on the AccuDraw compass, via an option menu can be changes for the X axis, Y axis, negative X and Y axis and compass frame

Delayed Update: If on (default is off), the coordinates are updated in the AccuDraw window when pointer is at rest. If off the coordinates are continuously updated, as the pointer move.

Show Negative Angles: If on (default), AccuDraw displays negative angles (+/-180°)

Pop-up Confirmation: If on (default), AccuDraw displays shortcut popups.

Shortcut Key-ins: Opens dialog that lists AccuDraw shortcut keys.

Coordinates Tab

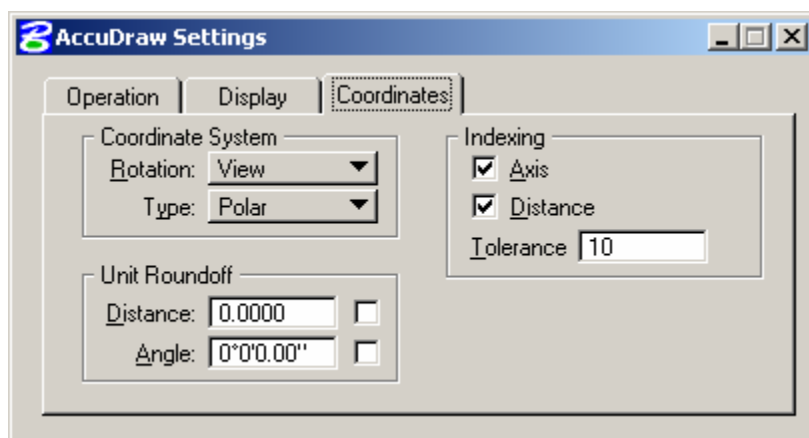


Figure 2-63: AccuDraw Settings Coordinates Dialog

Rotation: The AccuDraw compass can be rotated: Top, Front, Side, View, Auxiliary and Complex. Context lasts only for the current drawing tool

Type: Sets AccuDraw Compass to Rectangular or Polar

Unit Roundoff: This works like a grid, that helps place “freehand” drawings to a specific **Distance** and **Angle**.

Indexing: The **Distance** required to move the pointer from the indexed **Axis** is controlled by the **Tolerance** setting.

♪ Tolerance is measured in screen pixels, 1-99 allowed

ACCUDRAW SHORTCUT COMMANDS

Accudraw shortcut commands are invoked by typing either the single letter or combination of two letters as outlined in the **Accudraw Shortcuts** dialog (Figure 2-64).

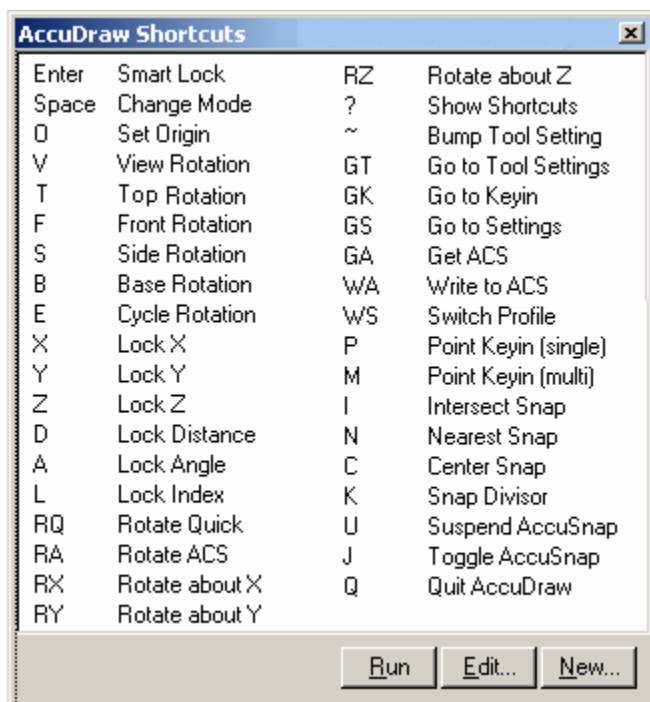


Figure 2-64: *Accudraw Shortcuts Dialog*

♪ Note that these shortcuts will only run if *Accudraw* has *focus*. For a complete list of shortcuts, type (Shift+?).

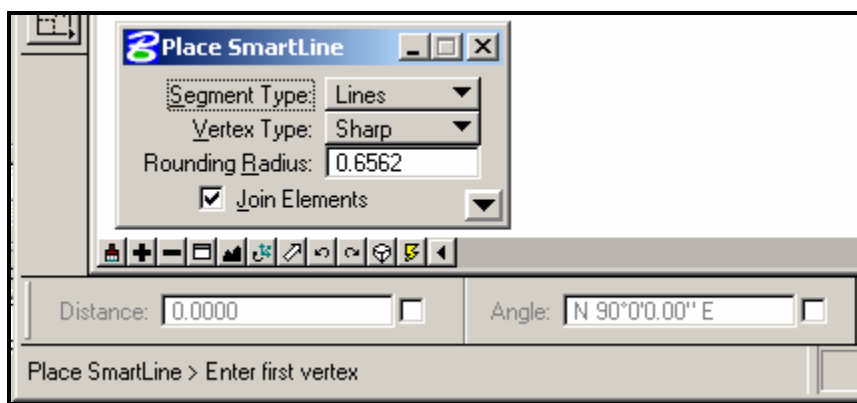


Figure 2-65: *AccudrawDocked - Focus OFF*

Note also that the *Tool Settings Window* has *Focus* (like the **Place SmartLine** window in Figure 2-65) and *AccuDraw* is grayed. The **Esc** key toggles focus back and forth between *Accudraw* and the *Tool Settings Window*. If I were to hit the **Esc** key (located in the upper left of my keyboard), the Focus will change to the *AccuDraw* (Figure 2-66) and the *Place SmartLine* window is grayed.

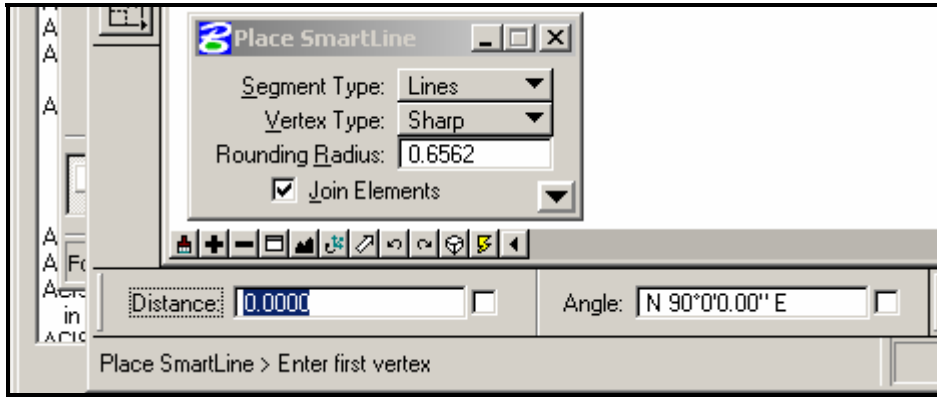


Figure 2-66: Accudraw Docked - Focus **ON**

Some Important Shortcut Keys

Try to get used to using the **K**, **N**, **C**, **O** and **I** shortcuts to activate your *Keypoint*, *Nearest*, *Center Origin* and *Intersection* snap modes.

ACCUDRAW EXAMPLE: ROADWAY TEMPLATES

Calculating Slope

Accudraw can be used to calculate your cross slopes easily. The basic theory is to figure the “drop” for the distance and slope of your lane. Mathematically, to know how far a 3.3 m lane will “drop” at a -2% slope, you would multiply $3.3 * .02$. This results in a .066 m drop. *Accudraw* can do this for you in one easy step.

First select the **SmartLine** and place the first point.

Move your cursor in the X direction so that *Accudraw* sets its *focus* in the X field. Input your lane width 3.3 meters as a horizontal distance (Figure 2-67).

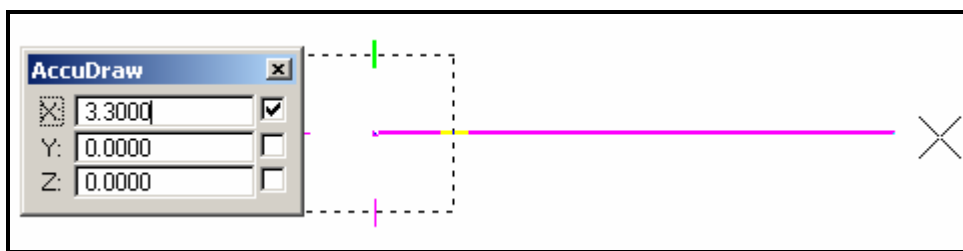


Figure 2-67: Enter Width in Accudraw

Move the cursor in the Y direction, shifting the “focus” of the *Accudraw* window accordingly. (For a negative slope move the cursor down or up for a positive slope.)

Enter the horizontal distance again, 3.3m. Then, using [SHIFT 8], evoke the multiplication function of *Accudraw* and enter .02. By entering your slope in decimal form, you will be multiplying the lane width by the slope to calculating the drop (Figure 2-68).

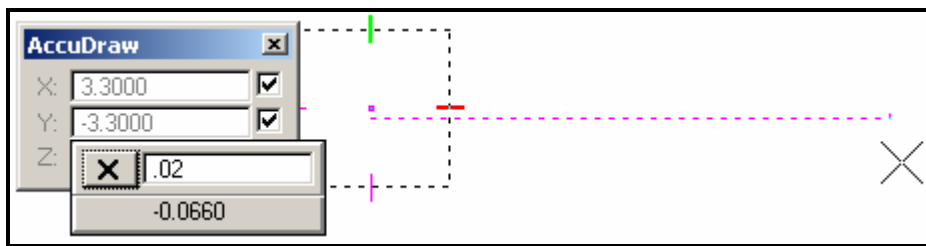


Figure 2-68: Calculate Vertical Drop Based on Slope

By accepting this position, you have just placed a line that extends the width of your lane and drops according to your decimal slope. If you then hit the “V” on your keyboard, the *Accudraw* compass will rotate parallel to the view and you can continue placing a shoulder without quitting the SmartLine command.

Placing Accudraw’s Origin

You can change the origin of your line and make it relative to a position on the screen. This comes in handy when drawing typicals from scratch. For instance, if you drew the finished grade using the distance/slope method described earlier, you could use the Origin function of *Accudraw* to lay your pavement lines.

First, *snap* to the place that you want to move your origin from.

In this example, you would start with the smart line command and then snap on the centerline position of the finished grade (Figure 2-69).

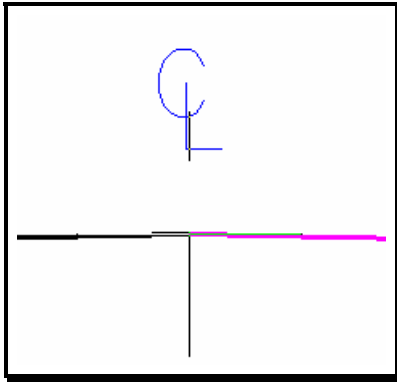


Figure 2-69: Tentative on the Centerline

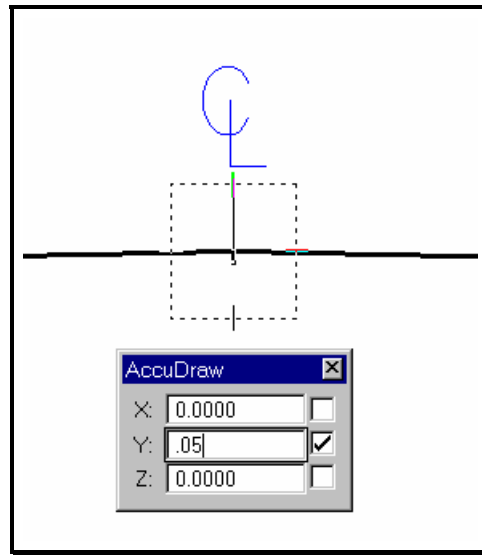


Figure 2-70: Accudraw Origin

Without accepting that position, hit the “O” on your keyboard to invoke the **Set Origin** function of *Accudraw* (Figure 2-70).

This will allow you to move your cursor without actually drawing a line. If you move your cursor in the Y direction, you can then input the exact distance you want to move away from your snap point and begin drawing. So if you wanted to move down 50 mm and start drawing again, you would move your cursor down and then type in .05. By accepting that position with a *data point* you can begin to draw again (Figure 2-71).

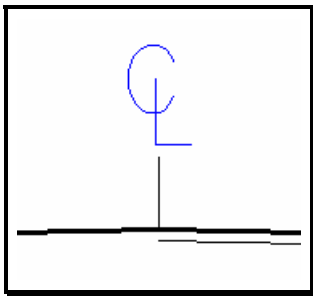


Figure 2-71: Free to Draw

Likewise, you can use multiple Origins to move first in one direction, and then another. With this functionality, you will hardly ever have to use construction lines. The *Accudraw* Origin will allow you to move around and position your cursor almost anywhere in relation to other elements in your design file.

DRAWING IN SUB-UNITS

Sometimes, it is easier to draw in sub-units. With the introduction of the metric system, the conversion to master units is made quite easy.

1000 mm = 1m

500 mm = 0.5m

30 mm = 0.03m

...and so on and so on. But still, there will be times when you will want to draw in sub units, especially for U. S. Customary jobs.

This is done easily and simply with *Accudraw*. All you need to do is choose your starting point for your line and then input the distances using a colon or semicolon (: or ;) before the numbers (Figure 2-72).

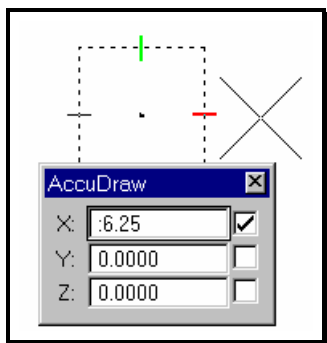


Figure 2-72: Subunits in Accudraw

This tells *Accudraw* that you will be using the sub-units. For instance, if you were working in an U. S. Custom job (ft, in) and wanted to draw a line that is 6.25 inches long; all you would have to do is input that distance in your *Accudraw* window with **:6.25**. (Using the proper X,Y, Z depending on what direction you want to move in)

MEASURING

COORDINATE READOUT

Control the display of your working units from your main menu by selecting **Settings > Design File > Coordinate Readout** (Figure 2-73).

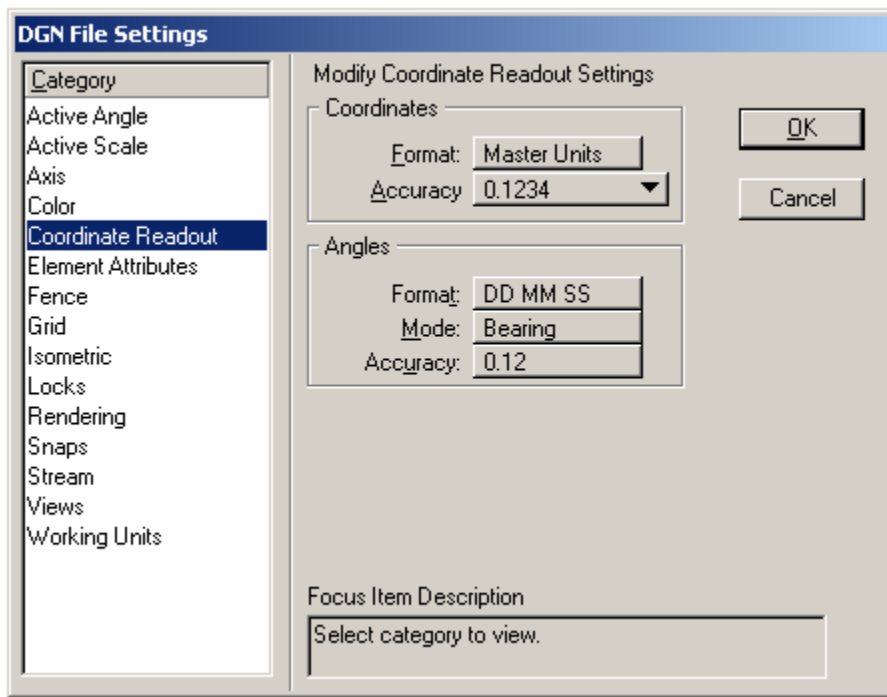


Figure 2-73: Design File Coordinate Readout

This area is going to control how MicroStation displays linear and angular measurements to you.

Linear Units, Accuracy

In the **Coordinates** area of this dialog, choose **Format** (Figure 2-74) and **Accuracy** (Figure 2-75).

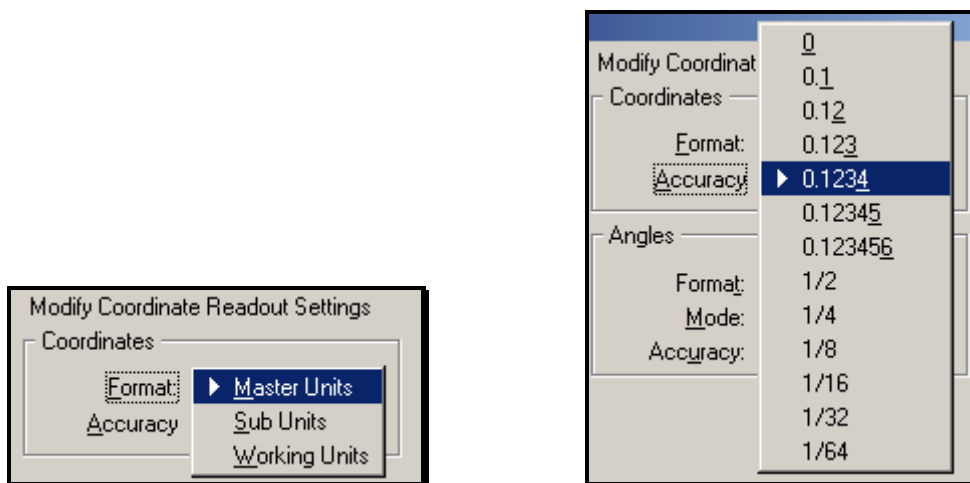


Figure 2-74: Coordinate Format

Figure 2-75: Coordinate Accuracy

The **Format** should be set to **Master Units** for working in metric drawings.

- ♪ The only time you would set **Format** to other than **Master Units** would be for U S Custom work. You might set it to **Sub Units** to display Imperial projects in feet and inches (whereas keeping it set to **Master Units** in Imperial will display data in decimal feet.)

Set your Accuracy to reflect how many decimal places you want your measurements displayed to.

Angle Accuracy and Mode

From the **Angles** portion of the **Design File Settings Dialog** you can control the **Format** (Figure 2-76), **Mode** (Figure 2-77), and **Accuracy** (Figure 2-78) of MicroStation's angular display.

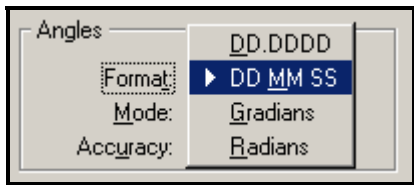


Figure 2-76: Angle Format



Figure 2-77: Angle Mode

Choose whether you want the **Format** of your angular display to be in decimal degrees or in degrees, minutes and seconds.

Choose whether you want your **Mode** to be **Conventional**, **Azimuth**, or **Bearing**.

Conventional angles start with 0° at 3:00 (on a clock) and increasing counter-clockwise (90° would be 12:00). **Azimuth** angles start with 0° at 12:00, increasing clockwise (90° would be at 3:00). **Bearing** angles are expressed in terms of North/South X° East/West.

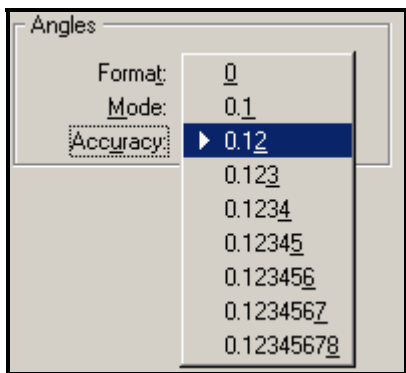


Figure 2-78: Angle Accuracy

Set your angular accuracy to as many decimal places as you want.

- ♪ Note that if your **Format** is **DD MM SS**, then your **Accuracy** is the number of decimal *Seconds* you want displayed.

MEASURING PART 1

You can access all measuring commands from your main menu by selecting **Measure** (Figure 2-79).

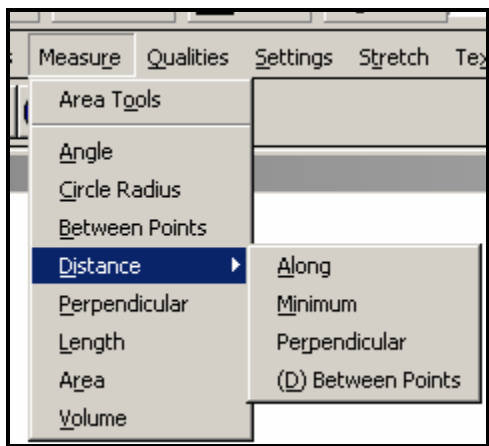


Figure 2-79: Measure Menu

Circle Radius, **Length**, **Area**, and **Volume** require that you simply identify one element.

🎵 **Circle Radius** can be used to measure the radius of arcs and ellipses as well.

Angle and **Distance > Minimum** require that you identify two elements.

❗ **Perpendicular measuring sometimes gives unexpected results in 3D files. If you encounter this, flatten your file and try again or try the Measure Distance Between Points command while using Accudraw to get the Perpendicular distance.**

MEASURING PART 2

Measuring Areas

With a basic understanding of *Region Creation*, measuring areas becomes straightforward.

From your **Main Tool Frame**, select **Measure Area** (Figure 2-80) or choose **Measure > Area** from the main menu.

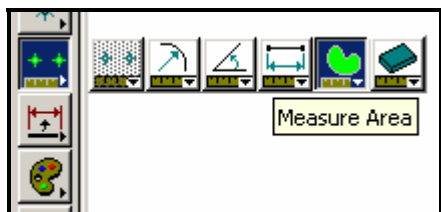


Figure 2-80: Measure Area

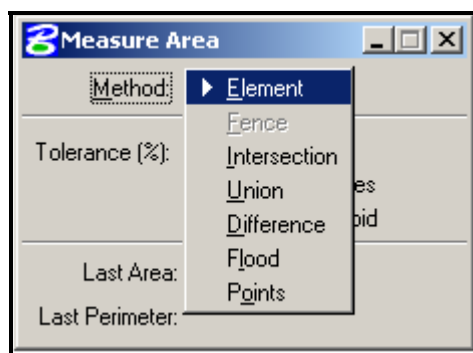


Figure 2-81: Measure Area Methods

A brief look in the **Tool Settings Window** should reveal some familiar **Methods** (Figure 2-81).

Element: measures the area of a single closed element

Fence: measures the area of a fenced area.

Intersection: measures the area where two or more closed elements overlap.

Union: measures the total area encompassed by two or more closed elements.

Difference: measures the area of a single closed element with “bites” taken out by other closed elements.

Flood: finds an enclosing region around a *data point*.

Points: measures the area of a polygon entered by the user.

Look at **Measure > Area Tools** for measuring and labeling areas in one fell swoop.

TIPS AND TRICKS

We have a number of tools and tips to make the measurement of areas easier.

Using Flood with PowerSelector

If you are working in a crowded area, you will have a hard time using the *Flood* method to pick exactly the area you want to measure. This is because *Flood* is confused by lots of crossing lines. To simplify matters, start by using the *PowerSelector* to pick only the elements that make up the outline you want to measure. Now use *Flood* and data point somewhere in this area. *Flood* will look only for highlighted elements when it looks for an enclosing *region*.

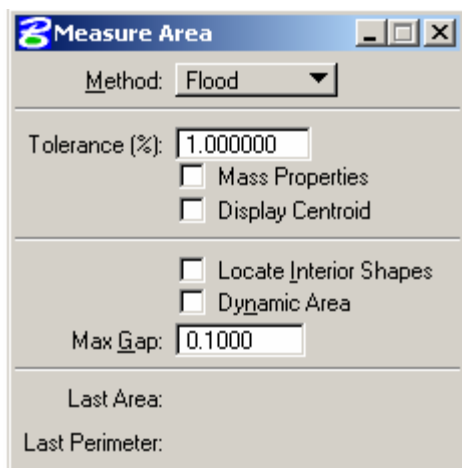


Figure 2-82: Measure Area by Flood Options

If MicroStation can't find an enclosing *region*, you may have some slight gaps between elements. Try changing your **Max Gap** value to a higher number (Figure 2-82). If you have to set it higher than .1, you may need to make sure that your file is flat and that you have selected all of the elements that make up your boundary.

✓ Check *Flattening your Active File* on page 2-83.

Converting Metric Measurements to English

We have a macro that will convert your metric measurements directly into English units.

All you have to do is measure your area in Metric, then run the **acre.bas** macro. ROW users press **Alt+F2** or **Utilities>Macro>MicroStation BASIC>acre**. This will bring up the **Area** dialog (Figure 2-83).

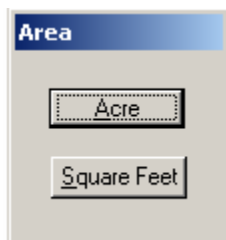


Figure 2-83: Area Macro Options

Press the unit that you want to label and the macro will stick text right on your pointer. Make sure to have your text height and font (229 verdana) set up right beforehand.

- ♪ If you find, in the middle of the macro, that your text height is wrong, just **Reset** and pick the right text height. Then re-run the macro. You do not have to re-measure the area. MicroStation remembers the last area that you measured.

REFERENCE FILES

REFERENCES DIALOG

Select: **File > Reference (DOT)>Dialog**. This will open the **Reference Dialog** (Figure 2-84).

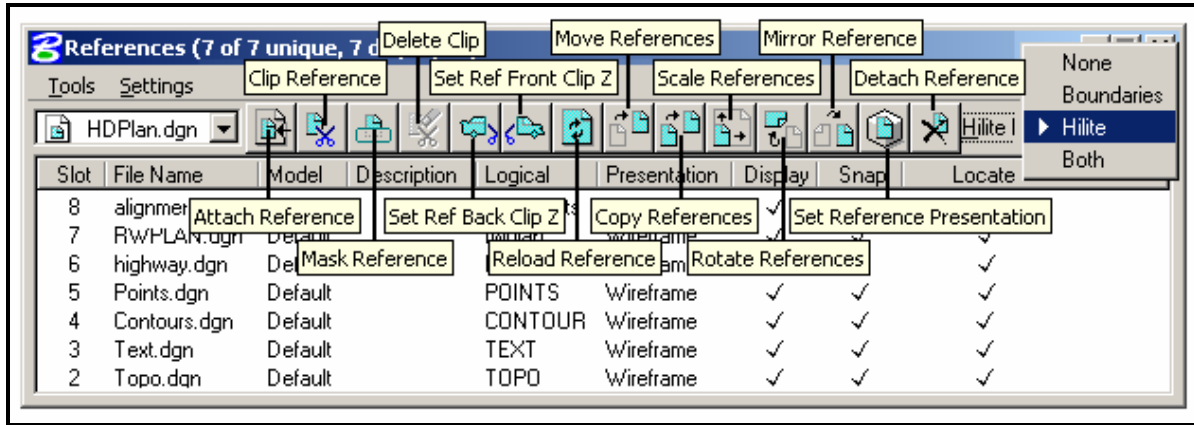


Figure 2-84:Reference Dialog

List box

Slot: The a number of a File referenced

File Name: The name of the DGN being attached

Model: The name of the Model that contains the elements diplayed

Description: A description of the file reference

Logical: A name assign to the file being referenced

Presentation: The Display Mode of the graphics

Display: By clicking the checkmark turns the graphics in the file **On** or **Off**

Snap: When checked **On** snapping to an element is possible

Locate: When ckecked **On** allows elements to be copied into the *Active File*

You must first select a reference file in the *List Box* before you can change a setting or select a tool. However, you can change the Display, Snap, and Locate settings for DGN files simply by clicking in that column.

Icons

Attach Reference: Used to attach a reference to the active file

Clip Reference: Used to display only graphic inside a fence boundary

Delete Clip: Deletes the clip boundary of a reference

Set Ref Back Clip Z: Sets the back clipping plane for a 3D reference

Set Ref Front Clip Z: Sets the front clipping plane for a 3D reference

Reload Reference: Reloads all references, allowing you to see changes made since being loaded

Move Reference: Moves a reference

Copy Reference: Copies a reference

Scale Reference: Scales a reference

Rotate Reference: Rotates a reference

Mirror Reference: Mirrors a reference

Set Reference Presentation: Changes the display: Wireframe, wiremesh, etc.

Detaches Reference: Detaches a reference

Hilite Mode

Highlighted and/or surrounded a reference by a border when placed in the active file.

None: Does not place a dashed border or highlight the select reference.

Boundaries: Places a dashed border around the select reference.

Hilite: Highlights the selected reference.

Both: Places a dashed border and highlights the selected reference.

Main Menu (Tools)

Attach: Used to attach a reference to the active file

Attach URL: Opens the Select Remote Design File to Attach dialog box, which is used to attach a remote referenced model

Detach: Detaches a selected reference

Detach All: Detaches all references

Reload: Reloads a references, allowing you to see changes made since being loaded

Reload All: Reloads all references

Ref Agent: Opens the Reference File Agent dialog box, which enables you to automatically maintain local copies of remote references

Exchange: Toggles from the master file to an attached reference

Move: Moves a reference

Copy: Copies a reference

Scale: Scales a reference

Rotate: Rotates a reference

Merge Into Master: Merges reference models to the active file.

Make Direct Attachment: Promotes the nested attachment to a direct attachment so it can be modified. The nested attachment becomes redundant with the newly created direct attachment. Quotation marks under Display, Snap, and Locate indicate a redundant attachment.

Mirror Horizontal: Mirrors a reference about the horizontal axis.

Mirror Vertical: Mirrors a reference about the vertical axis.

Clip Boundary: Used to display only graphic inside a fence boundary

Clip Mask: Masks a part of a reference that is inside a fence boundary

Delete Clip: Deletes the clip boundary of a reference

Clip Front: Sets the front clipping plane for a 3D reference

Clip Back: Sets the back clipping plane for a 3D reference

Main Menu (Settings)

Settings: Opens the an *Attachment Settings Dialog* that is used to set attachment information for references

Presentations: Opens the *Set Presentation Dialog* used to set presentation for references

Update Sequence: Opens the *Update Sequence Dialog* used to change the order of display for references

Adjust Colors: Opens the *Adjust Reference Color Dialog* used to modify or change colors of references

REFERENCES ATTACH

Most of the file will already be attached. From time to time files will need to be attached. To attach a reference from the same PIN without *Browsing*: **File>Reference (DOT)>Attach**. This will open up the **Attach Reference** dialog (Figure 2-85). This is an automated routine to look at where you entered MicroStation thru the projects list and place you into the proper directory tree.

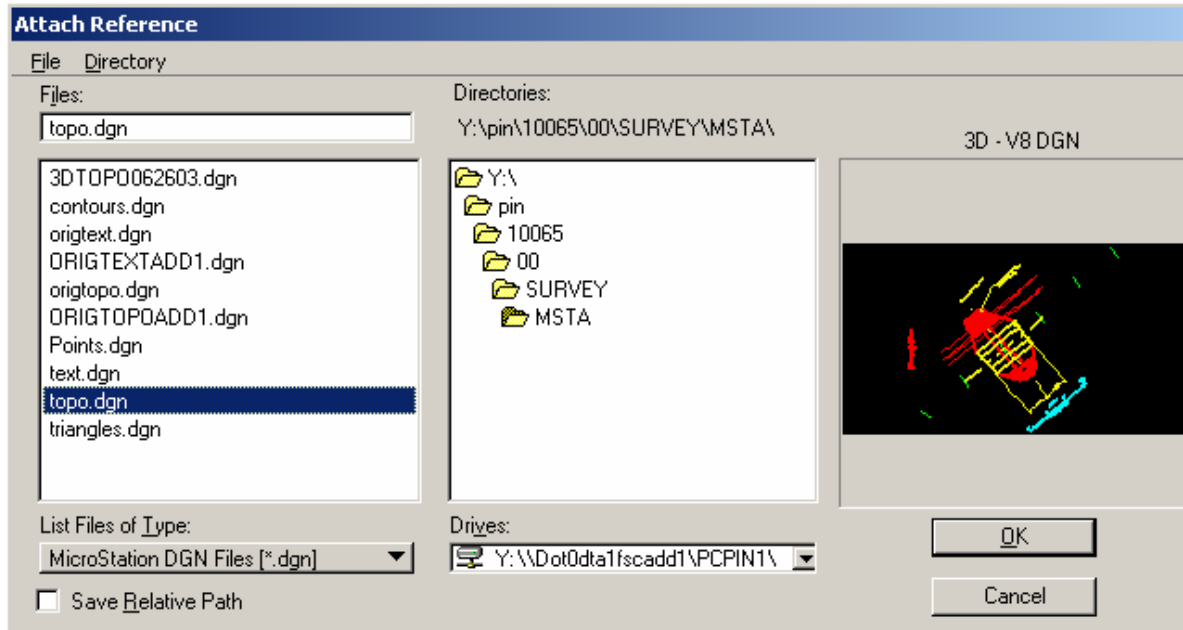


Figure 2-85: Attach Reference

Browse to the SURVEY\MSTA directory and select the file and **Click OK**. If **File>Reference (DOT)>Attach** is not used be sure that you are browsing in the proper directory because MicroStation remembers the last place you went to attach a reference file.

This brings up the **Attach Reference Settings** Dialog (Figure 2-86).

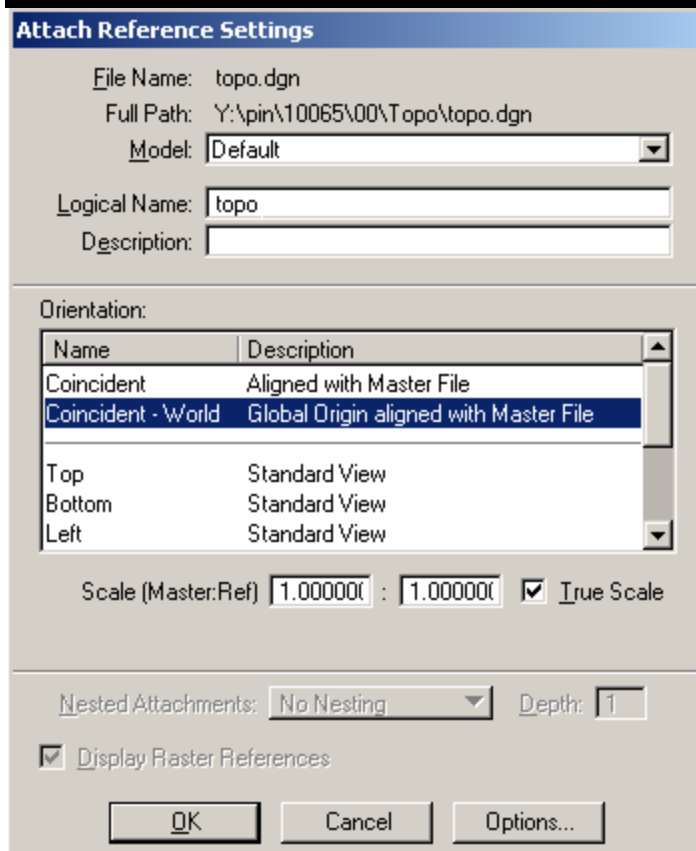


Figure 2-86: Attach Reference Settings Dialog

For now work is done in the **Default Model**. Type in a **Logical Name** (topo), select Orientation (Coincidental-World Global Origin align with Master File), **Scale (Master:Ref) 1:1** and **True Scale Checked**. Push the **OK** button. Push **Fit View** (on the lower left of the window border) to see all your reference files. **Nested Attachments** (Figure 2-87) will be grayed if no files are attached to the file being referenced.

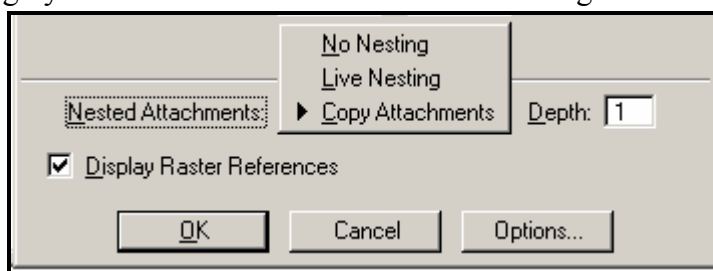


Figure 2-87: Nested Attachments

Nested Attachments

Nesting describes how nesting of references is handled.

No Nesting: References attached to the file being referenced will not be displayed

Live Nesting and **Copy Attachments:** References attached to the file being referenced will be displayed and appear in the list of reference

Depth

0: References only the file being attached

1: References the file and any files being reference to it

2: References the file, any files being reference to it and references any files attached to those and so on

For example, *Live Nesting*: File B is attached to file A. Further, file B also has file C attached. If you detach file C from B, file C will no longer appear as attached to file A.

Where *Copy Attachments*: File A has an attachment, file B which also has an attachment, file C, if file C is detached from B, file C will still appear as attached to A unless C has been explicitly removed.

Display Raster References

When a rastered image is attached to a file a **Checkmark** can be placed in the box with a data click to display the image. If there is no image attached to the file the area on the Attach Reference Settings Dialog will be grayed.

REFERENCE FILE MOVING

Everyone likes to have some control on how the plan appearance looks. You have the ability to move your reference files around in your border.

Select: **File > Reference** to open the **References Dialog** box (Figure 2-88).

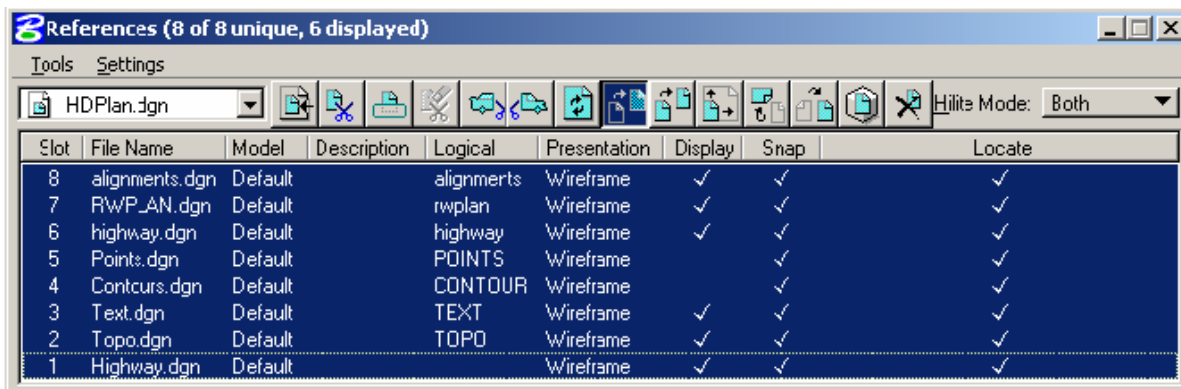


Figure 2-88: Reference Dialog

Highlight the reference file or files that you want to move. From the **Reference Dialog** box, select **Tools>Move**.

MicroStation will prompt you (in your **Status Bar**) to “Move Reference File > Enter Point to move from.” Enter a data point. MicroStation will now prompt you to “Move Reference File > Enter point to move to.” Enter another data point. MicroStation will move all the reference files you selected from the first point to the second point.

REFERENCE FILE ROTATION

MicroStation 3D files allow for reference file rotation in the **X**, **Y**, and **Z-axis**. When working in a plan view, reference file attachments will only need to be rotated around the **Z-axis**.

Select: **File > Reference**. This will open the **References Dialog** box (Figure 2-89).

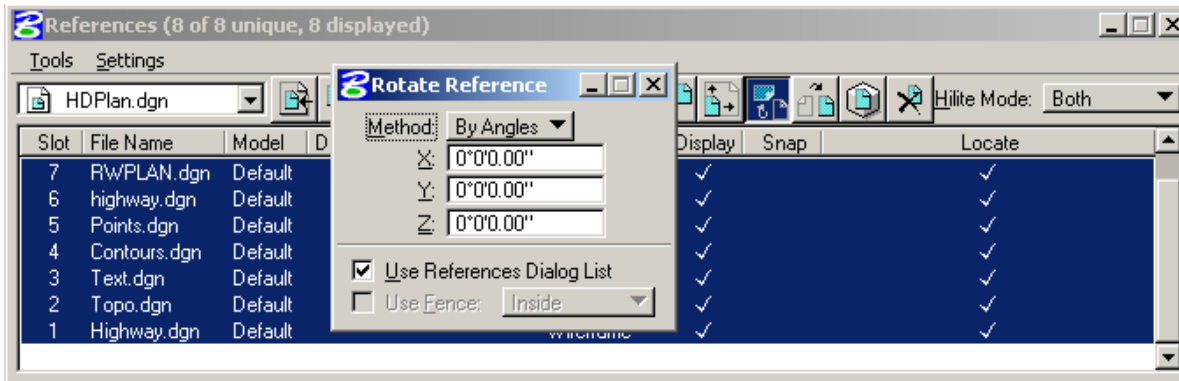


Figure 2-89: Reference Dialog

Let's begin by selecting the file or files you want to rotate. From the **Reference Files** dialog, select **Tools>Rotate**. This will open up the **Rotate Reference File Dialog**. Set the angle to rotate around the **Z-axis** and send a data point to your screen. After rotating you may want to move the reference files to a more precise location on your border.

✓ Refer to Reference File Moving, page 2-69.

RASTER FILES

RASTER ATTACH

To attach a *Raster Image*: **File>Raster Manager**. This will open up the **Raster Manager Dialog** (Figure 2-90).

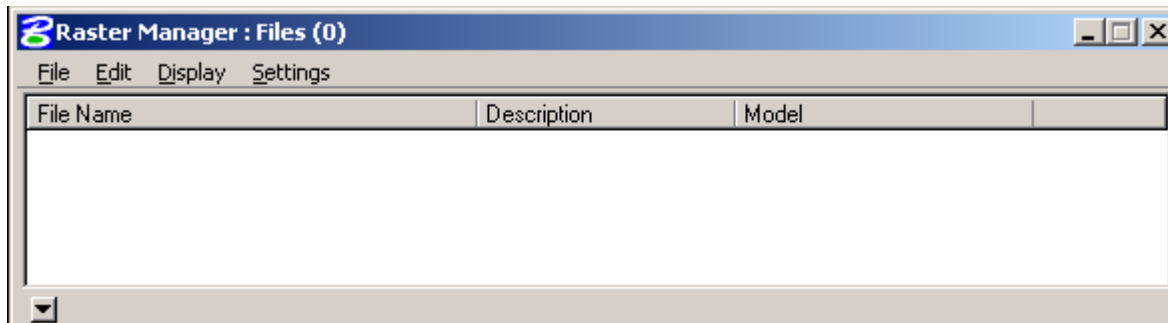


Figure 2-90: Raster Manager Dialog

Before the image is placed in MicroStation, place a rectangle sized so when placing Data Points at opposite corners the Image will be to scale. **Right Click** on the **Start Button** and select **Explore** from the submenu to open a **Windows Explorer** (Figure 2-91).

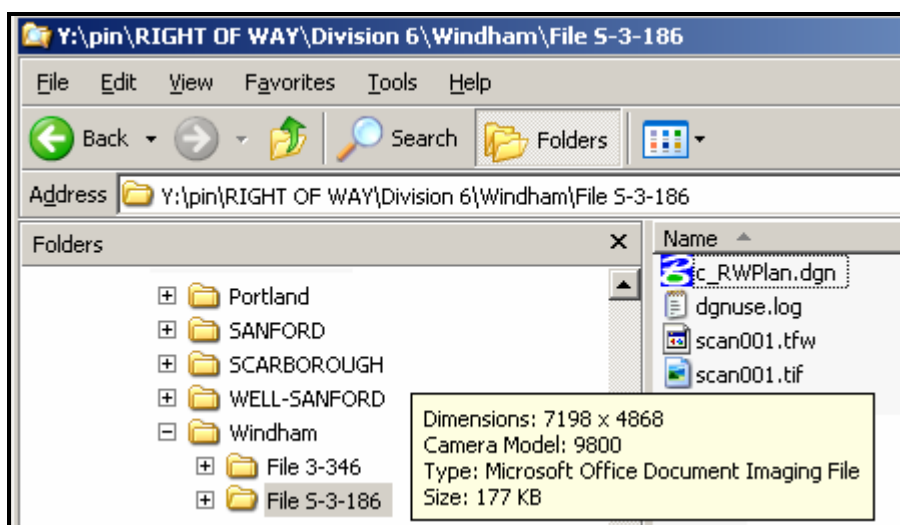


Figure 2-91: Windows Explorer

Determine Image Size

By hovering the image file box will appear showing **Dimensions**. The 9800 is in the Reproduction Room which scans images at 200 dpi's (dots per inch). Divide the dimensions by 200 ($7198 \div 200$ & $4868 \div 200 = 35.99 \times 24.34$) the results will be the size of the rectangle in inches. For a 1"=25' the dimensions need to be multiplied by 300 (12x25).

Place Block

Start MicroStation, select the **Place Block** and place the first point. Move your cursor in the X direction so that *Accudraw* sets its *focus* in the X field. Input ;35.99 (subunits) using [SHIFT 8], evoke the multiplication function and enter 300 for the horizontal distance. Move the cursor down in the Y direction, shifting the "focus" of the *Accudraw* window

accordingly. Enter the horizontal distance ;24.34 *300 for the Vertical distance and enter a data point to finish the rectangle.

Attach Raster Image

From the main menu of the *Raster Manager Dialog*: **File>Attach**. When the **Attach Raster Reference Dialog** (Figure 2-91) open browse to select the Image File and hit **OK**.

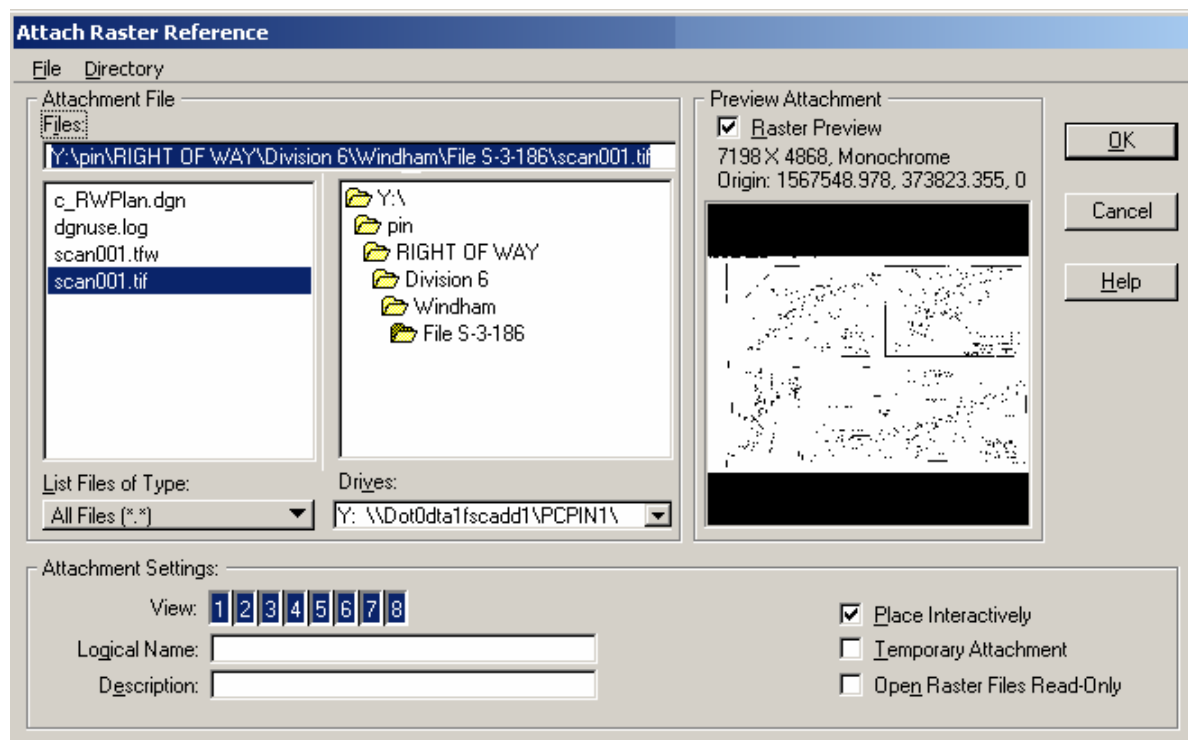


Figure 2-92: Attach Raster Reference

MicroStation will ask for **Enter Origin**, see *Status Bar*. Place a **Data Point** at the upper left corner of the rectangle previously created for the **Enter Origin** point. Next place a **Data Point**, in the lower right corner of the rectangle to enter the **Enter Corner** point. The scale of the image can be changed by **Scaling** the rectangle and detaching and reattaching the image: **File> Detach** and **File> Attach**.

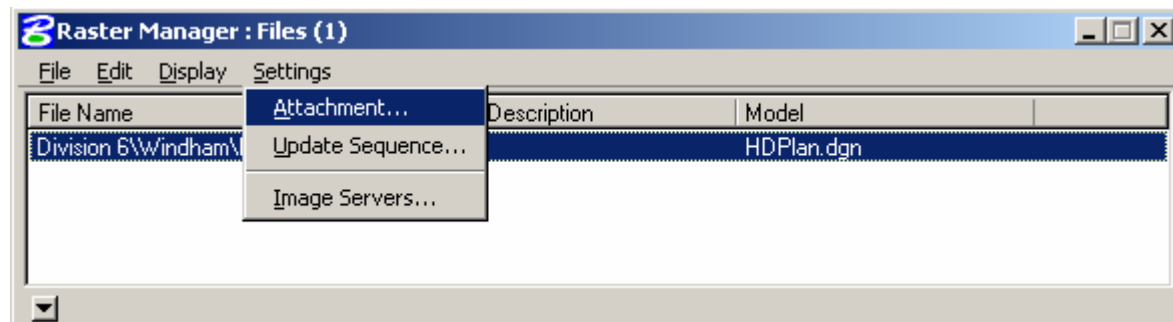


Figure 2-93: Raster Manager Attachment

In the *Raster Manager* (Figure 2-93) from the **Settings** submenu select **Attachment...** To

print the image white with black details the color may need to be changed. Open the **Color** tab (Figure 2-94) and check for a white **Foreground** and a black **Background**.

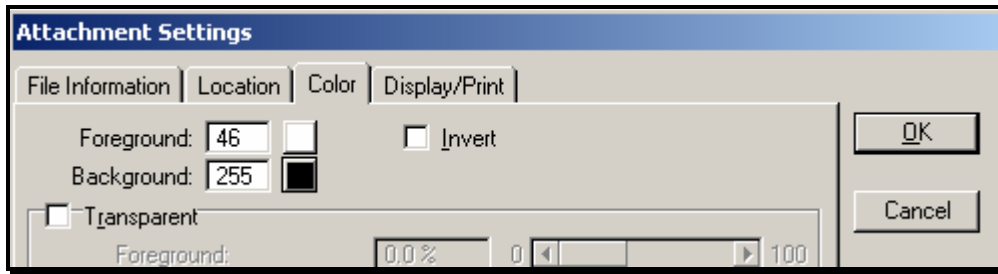


Figure 2-94: Attachment Settings

MACROS

BATCH PROCESS REFERENCE SETTINGS

This macro was created to speed up the process of revising reference attachments to sets of border files. This was used prior to the introduction of *Live Nesting*. Things you can do with the macro include:

Detach *Contours.dgn* from all plan sheets.

Turn off **Locate** for *Topo.dgn* in all plan sheets.

It can be launched from the main menu by choosing **File > Reference (DOT) > Batch > Settings**.

🎵 This procedure only needs to be processed on file that does not have **Live Nesting**.

Step 1

Follow the instruction on the **Batch Process Reference Settings** (Figure 2-95).

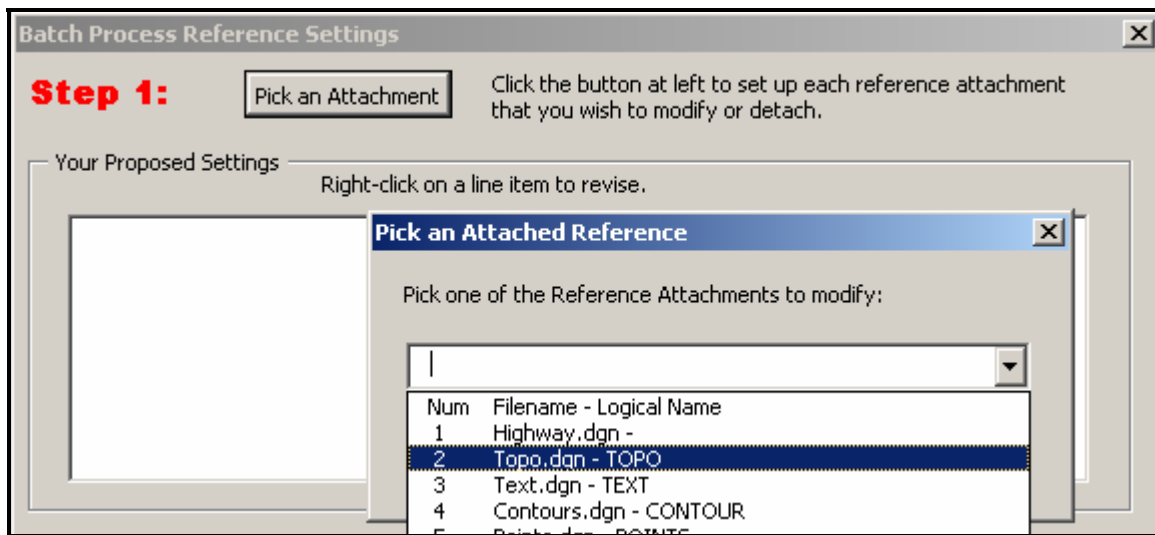


Figure 2-95: Batch Process Reference Settings Step 1

Select the file and click on **Detach** or **Modify**. In the **Modify Attachment Settings Dialog** (Figure 2-96) the **Attributes** can be toggle on or off. The **Levels** are now controlled with the **Level Display** or **Level Manager**. Click **Accept**.

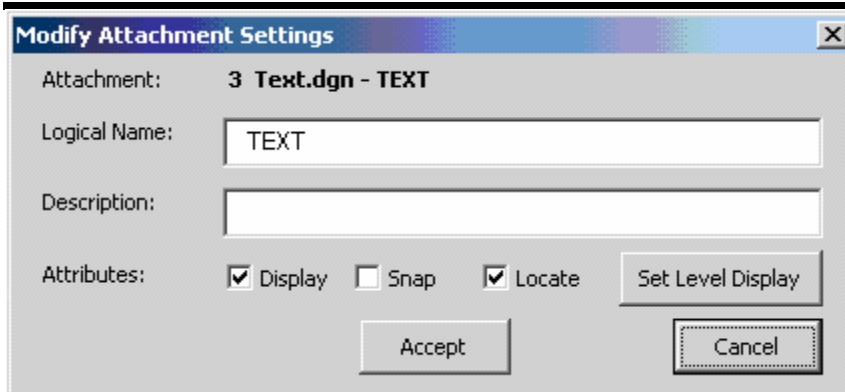


Figure 2-96 : Modify attachment Settings

Step 2 & 3

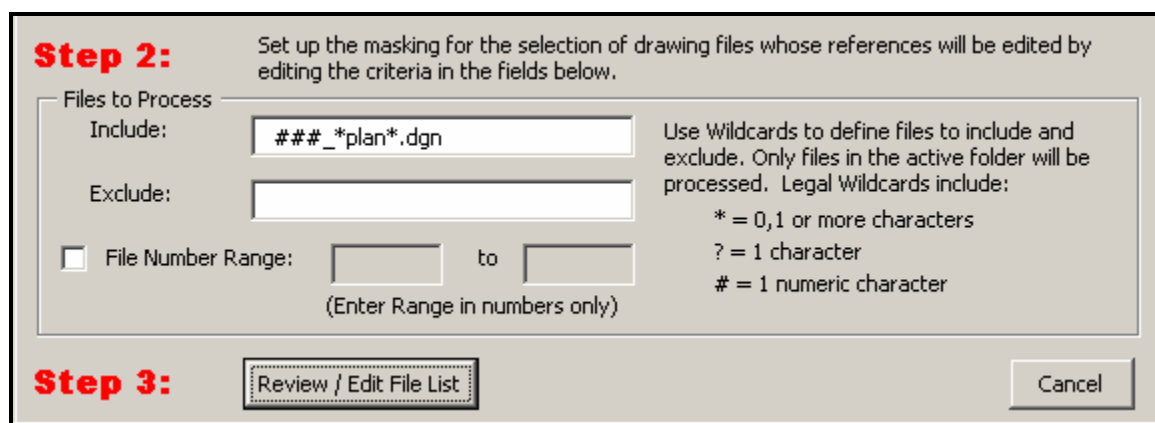


Figure 2-97: Batch Process Reference Settings Step 2

Fill in the file the settings need to be *Processed* and **Click the Review/Edit File List** button (Figure 2-97).

Step 4 & 5

Remove any files not to be processed in the **Confirm List for Processing Dialog** (Figure 2-98) and **Click the Process Files** button.

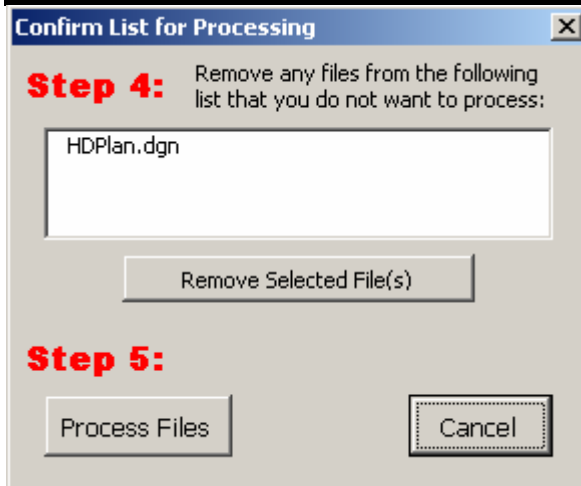


Figure 2-98: Confirm List for Processing Dialog

BATCH ATTACH REFERENCE FILES

This macro was created to speed up the process of attaching new files to existing plan sheets. It can be launched from the main menu by selecting **File > Reference (DOT) > Batch > Attach**.

🎵 This procedure only needs to be processed on file that does not have **Live Nesting**.

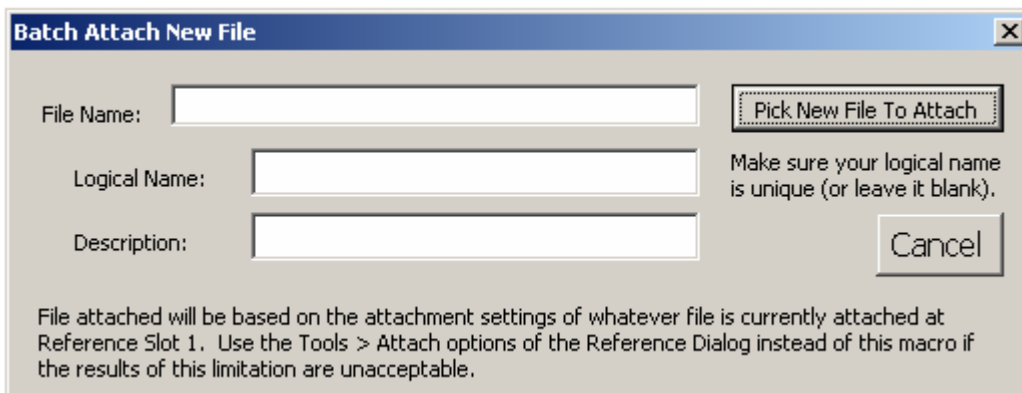


Figure 2-99: Batch Attach New File Dialog

From the **Batch Attach New File Dialog** (Figure 2-99) Click on the **Pick New File To Attach** button. When the **DGN file Dialog** (Figure 2-100) opens select the file to be attached and **Click Open**.

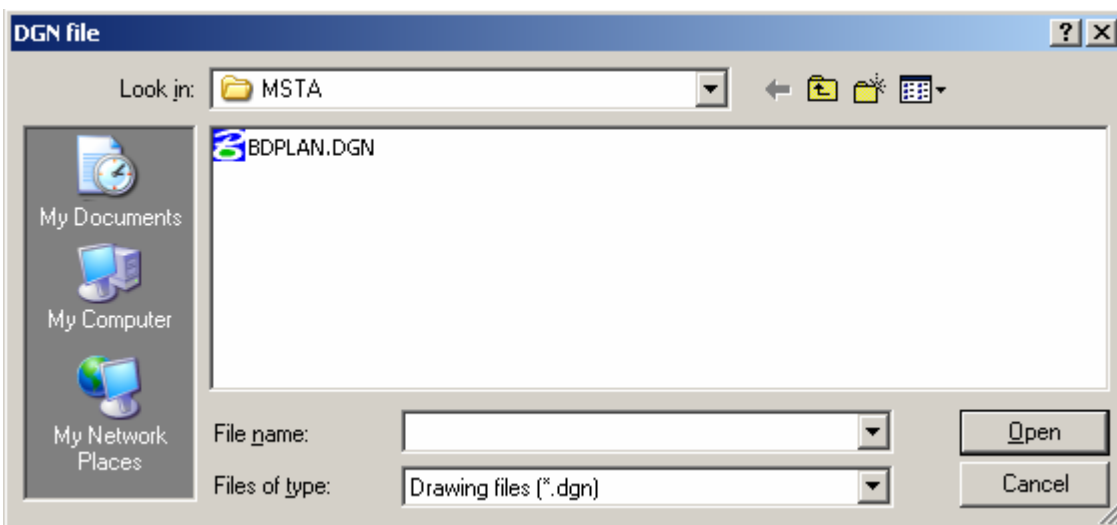


Figure 2-100: Batch Attach New File

Files to Process

Once you have pressed **Open** the **Files to Process Dialog** (Figure 2-101), define the files to Process and **Click OK**.

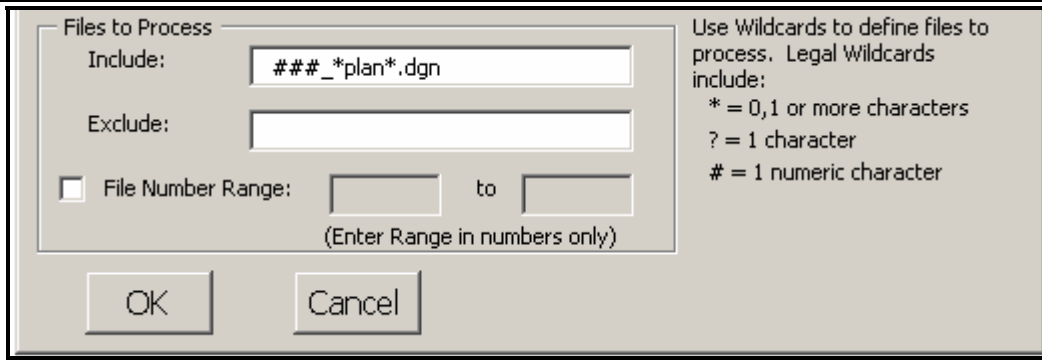


Figure 2-101 : Files to Process Dialog

A last chance dialog, **Confirm List for Processing Dialog** (Figure 2-102) will appear. Remove unwanted file and **Click the Proceed Button**.

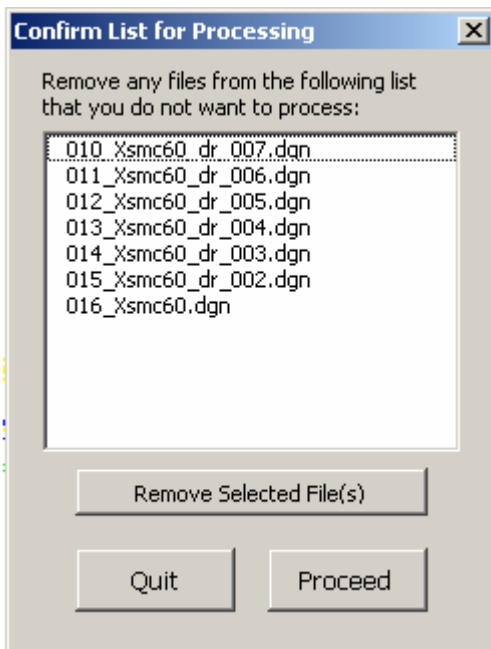


Figure 2-102 : Confirm List for Processing Dialog

HOTSWAP

Overview

This macro helps you navigate to specific elements in reference files.

Launch the Macro

From the main menu, select **File > Reference (DOT) > HotSwap**.

Identify the Element

MicroStation will prompt “Hotswap > Identify Element.” Click on the element with a *Datapoint*.

🎵 MicroStation will not allow you to identify Dimensions to swap to the reference file.
Pick a line, arc, circle, text, or some other basic element type.

❗ ***MicroStation will also not allow you to identify elements in your active file.***

Once you have picked an element, MicroStation will hilite the element and prompt you “Hotswap > Follow Element? (Accept/Reject).” *Datapoint to Accept* and MicroStation will open up the file of the indicated element.

Set Zoom Level

Once MicroStation has opened the target file, it will center your view window on the indicated element and open the **HotSwap Zoom Dialog** (Figure 2-103).

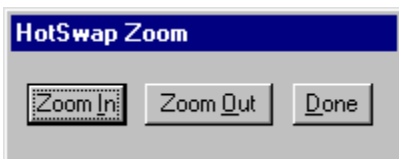


Figure 2-103: HotSwap Zoom Dialog

This dialog allows you to **Zoom In** or **Zoom Out** centered on the indicated element.

Press the **Done** button when you are finished zooming.

Tips

The easiest way to get back to your previous file is from your **File** menu.

At the bottom of the menu, right below **Protection** there should be a list of files. File number 1 is your active file. File number 2 is your previous file.

Open your previous file from the main menu by choosing **File > 2 [Filename...]** from the list of files.

LABEL SLOPE BY POINTS

Overview

This macro was created to make it easier to label roadway lines with the appropriate slope value.

Setup

Set your text up to the proper style and scale by using your *Settings Manager*.

✓ *Refer to page 2-20 for more information on the Settings Manager.*

Run the Macro

From your Settings Manager, choose **Prop. Text and Dims > Slope %**. MicroStation will prompt you in the status bar “SlopeByPoints > Enter First Point.” *Snap* and *Accept* to a point on the slope you wish to define.

MicroStation will prompt you in the status bar “SlopeByPoints > Enter Second Point.” *Snap* and *Accept* to another point on the slope you wish to define.

You will get a positive slope if your first point is below your second point. You will get a negative slope if your first point is above your second point.

♪ For roadway slopes, snap to an inner point before an outer point.

Once you have defined your points, MicroStation will bring up the text dialog with your slope all typed in.

♪ You can edit the text at this point, if you desire. You could change the sign, degrees of accuracy, etc.

MicroStation will prompt you to “Place Text Above Element > Identify Element.”

Datapoint on the line you want to label, near the point you would like the text to be. The text will appear, highlighted, above the element you selected. *Datapoint* to *Accept*, or *Reset* to choose another point for text placement.

FLATTENING YOUR ACTIVE FILE

Flatten.bas is a BASIC macro that was designed to help you squash a 3D file down to a single elevation. It's like pressing a leaf in a book: it takes all of the peaks and valleys and presses them down.

When to Flatten

There are a couple of symptoms that may occur in your file to lead you to believe that you have a 3D problem. If you measure the distance between two points and find that it is much greater than you were expecting, perhaps those points are at different elevations. If you measure the length of a short line and find that it is hundreds of meters long, the line may be spanning two elevations.

How to Flatten

From the Main Menu, select **Macros > Flatten**. This will open the **Flatten File** dialog (Figure 2-104). Type in a target elevation for your elements and press **OK**.

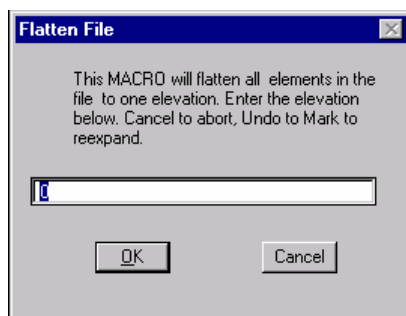


Figure 2-104: Flatten File Elevation

The Status Bar will prompt you to “Flatten Elements? (Accept in Plan View/Reject)”. Enter a *Data Point* in your plan view.

How to Undo The Flatten

If you change your mind about flat elements, you are going to have to take a special course to undo what you have done: namely, go to the Main Menu and choose **Edit > Undo Other > To Mark**.

♪ This is necessary because the Macro issues the scale command about ten times. If you were to undo singly, it would only undo one of those scales. The Macro sets a **Mark** in the file before it starts to scale though, so you can undo all of its impact in one fell swoop.

Other Options When Flattening

If you don't want to scale all the elements in your file, the Macro will allow you to scale only the contents of a Selection Set or a Fence. Pick a bunch of elements with the Element Selection Tool or the *Powerselector* or place a Fence before you run the Macro. The Macro will then only impact the elements you have selected.

Just What Exactly Does the Flatten Macro Do?

Flatten.bas starts by checking to see if you have an active Fence or Selection Set. If you don't, it executes the "Select All" command, picking all elements in the file. Then it prompts you to enter in an elevation for elements to be scaled to. Then it runs the "Scale" command, setting your active (xyz) scale to (1,1,0.00001). This scales in the xy direction by 1 (no change) and the z scale by 0 (flattening the elements.)

Next, the Macro turns off *Accudraw* (because the scale command tries to read *Accudraw*'s orientation, which could really screw up the automation.) Now the Macro gets a *Data Point* and changes the z-value of that point to equal the z-value entered by the user. The Macro then briefly turns off the display of elements to the screen (this saves processing time.) Next, the Macro runs the scale command ten times (just once doesn't seem to do it.)

Finally, the Macro turns element display back on (you shouldn't even notice a difference) and activates *Accudraw*. Even if you didn't have it on before, you'll have it on afterwards.

STEEL MACRO

Overview

The **Steel** macro draws standard steel shapes for the user. Selection is made in a graphic dialog box based on shape type. The user has the option of placing shapes by any of nine points of origin, i.e. top left, bottom right, etc.

Step Zero: Preparation for the Macro

This macro is not going to set any appropriate level, color, style or weight. Before you launch the macro, use your *Settings Manager* and pick the most appropriate setting (i.e. **Structural Detailing > Superstructure.**)

Step One: Launch the Macro

Launch the macro from the main menu by selecting **Macros > Steel**. This will bring up the **Steel Selector Dialog** (Figure 2-105).

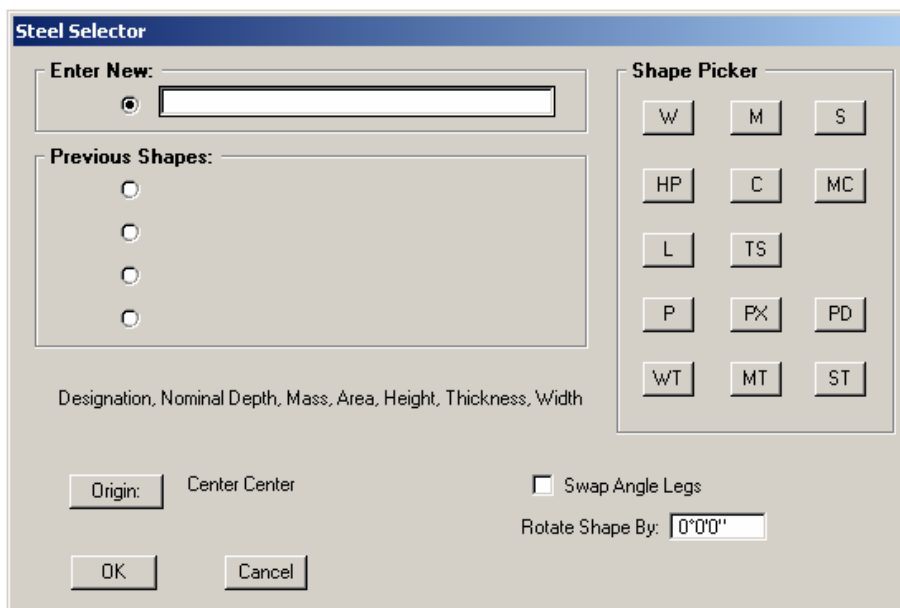


Figure 2-105: *Steel Selector Dialog*

Step Two: Pick Your Shape

On the right side of the **Steel Selector Dialog**, notice the section labeled **Shape Picker**. Each button in this area is labeled with a type of steel shape: **W**, **M**, **S**, etc. Find the steel type you want to place and click the button.

This will bring up the **Shape Picker Dialog** (Figure 2-106).

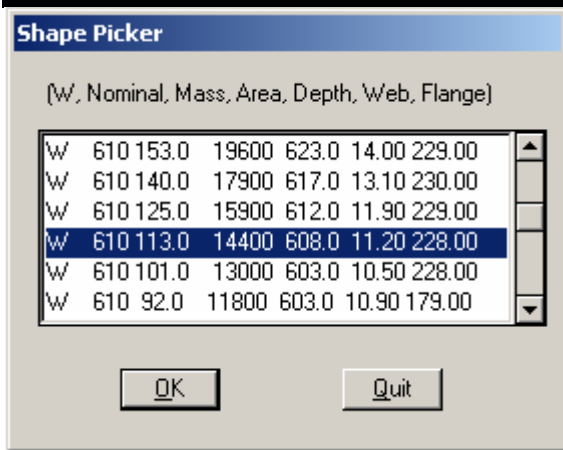


Figure 2-106: Shape Picker Dialog

This dialog is a scrolling list of all the available shapes of the type you selected. Scroll down the list until you find the shape you want to place, and then press **OK**.

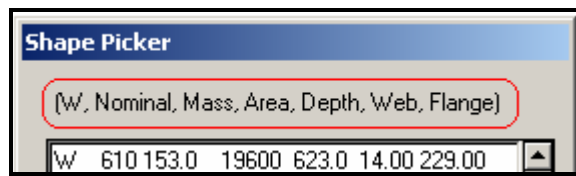


Figure 2-107: Steel Label

♪ If you have a hard time decoding the steel designations here, take a look at the text at the top of the dialog (Figure 2-107). These items correspond to the columns of text in the body of the **Shape Picker**, and should help you find the shape you're looking for.

Once you have picked your shape, the **Steel** macro will drop you back into the **Steel Selector Dialog** (Figure 2-108).

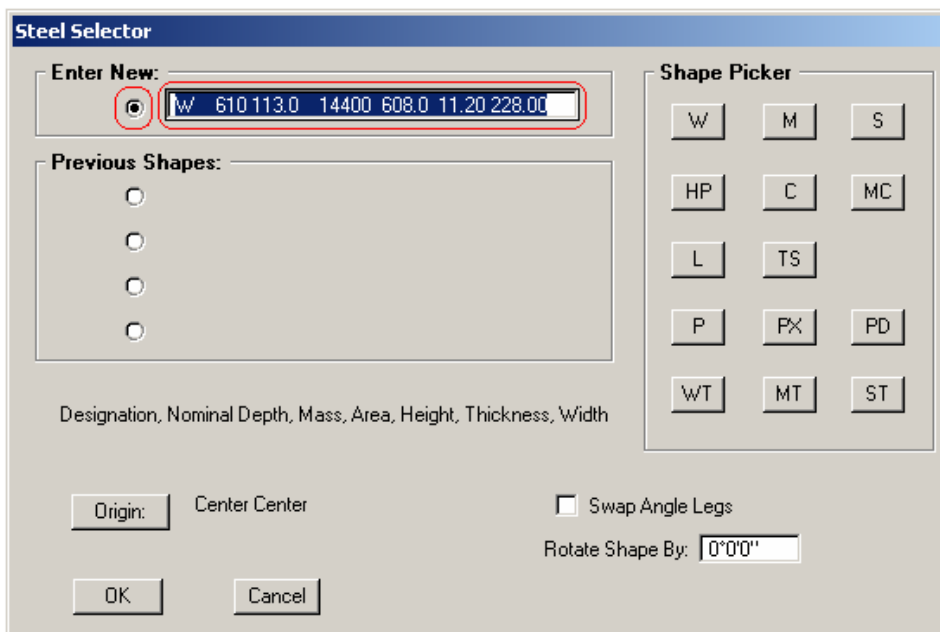


Figure 2-108: Steel Selector Take Two

♪ Notice that the shape you chose in the previous step is now highlighted in the **Enter New** box, and the **Selection Button** next to it is **Checked**.

Step Three: Choose an Origin

Now you need to make a decision about how you want to place this shape. On the **Steel Selector Dialog**, press the **Origin** button. This will bring up the **Placement Dialog** (Figure 2-109).

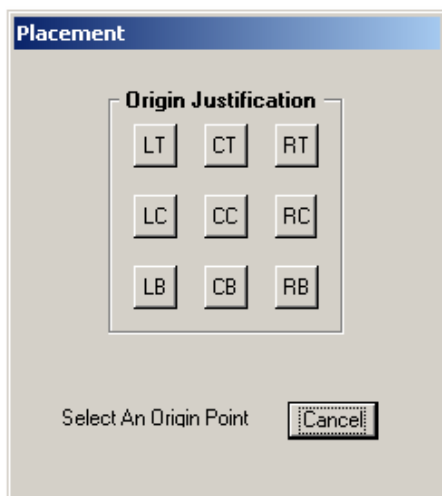


Figure 2-109: Placement Dialog

In the **Origin Justification** section of this dialog, there are nine buttons that you can press to set the justification. Your choice will depend on the detail you are working on. For this example, I'll choose **CT**, which is "Center Top." We'll see the impact of this when I place the shape.

Pressing any of those nine buttons will dismiss the dialog and bring up the **Steel Selector Dialog** again (Figure 2-110).

Steel Selector

Enter New:

☒ W 610 113.0 14400 608.0 11.20 228.00

Previous Shapes:

Designation, Nominal Depth, Mass, Area, Height, Thickness, Width

Shape Picker

W M S

HP C MC

L TS

P FX PD

WT MT ST

Origin: Center Top

☐ Swap Angle Legs

Rotate Shape By: 0°0'0"

OK Cancel

Figure 2-110: Steel Selector Take Three

Notice the **Origin** you selected in this step is displayed next to the **Origin** button. Press **OK** to place the steel shape.

Step Four: Place the Shape

Check your *Status Bar* for the prompt. It should say “Steel > Enter Origin of Shape (Reset to Exit.)” *Datapoint* to place your shape, *Reset* to abort. (You can also *Snap* to choose the origin point more specifically.)

The shape should appear where you *Datapoint* (Figure 2-111).

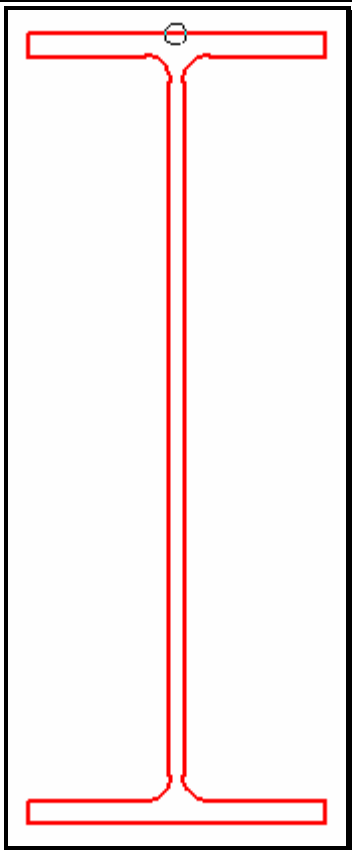


Figure 2-111: Placed Shape

- ♪ Notice the circle at the center of the top flange in Figure 2-111. This is the **Origin** point that I selected in **Step Three**.

Option One: More of the Same

If you want to keep placing more shapes like the one you just placed, just keep *Datapointing*. Until you *Reset*, MicroStation will continue to drop a shape wherever you *Datapoint*.

Option Two: Undo

If you have placed a shape in the wrong place, you can *Undo* the placement. From your main menu, select **Edit > Undo Other > To Mark**.

- ♪ This uses built-in MicroStation functionality related to setting *Marks* in your drawing – kind of like bookmarks – that allow you to *Undo* back to a specific point. You can set your own marks by choosing **Edit > Set Mark**.

Option Three: Using Previous Shapes

As you run the **Steel** macro a number of times to place different shapes, you should notice that it *remembers* shapes you've already placed. The most recent shape you've used is still in the **Enter New** box of the **Steel Selector Dialog**.

The four shapes you've used previously are stored in the **Previous Shapes** box in the **Steel Selector Dialog** (Figure 2-112).

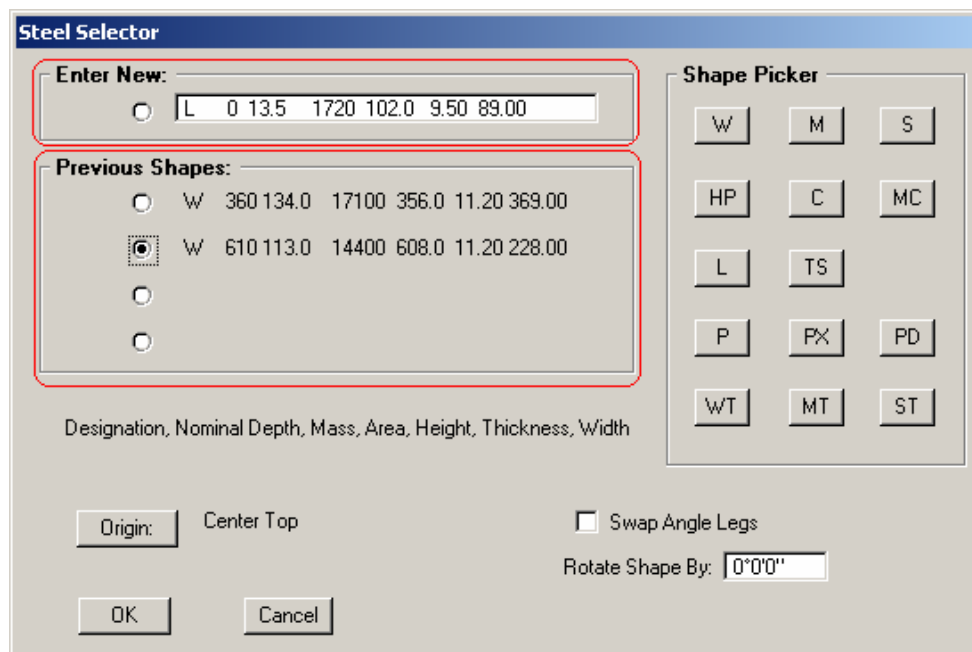


Figure 2-112: Steel Selector Previous Shapes

To place any one of these stores shapes, just **Check** the button next to the shape description, set your **Origin** and press **OK**.

Option Four: Angle Legs

L Shapes are drawn with **Leg 1** as vertical and **Leg 2** as horizontal. The resulting shape looks like an “L”.

There are two ways to change the way **Ls** are placed by this macro.

1. Push the **Swap Angle Legs** button. This reverses the placement of **Leg 1** and **Leg 2**. This essentially mirrors the default **L** over a 45° mirror line.
2. Set the **Rotate Shape By** angle to a non-zero value. This spins the **L** counterclockwise by the angle specified.

WELD MACRO

Overview

The **Weld** macro was written to make it easier to place consistent weld symbols on structural details. It prompts you to enter two *Datapoints*: one for the location of the weld, the second for the location of the symbol. Then you fill out a dialog box full of options and the macro places the weld symbol for you!

Step One: Launch the Macro

Run the **Weld** macro from your main menu by choosing **Macros > Weld**.

Step Two: Enter Points

Look in your *Status Bar*. MicroStation should be prompting you to “Select Weld Location to Be Labeled (This is where the arrow points.)

Datapoint or *Snap* to the location of the weld.

Once you have *Accepted*, MicroStation will prompt you to “Select Location of Weld Symbol (This is the end of the arrow.)”

❶ *If you snapped to the first point, you have to snap to define the second point as well. Place a tentative point (away from any element) in the approximate location you want the weld symbol to be drawn, and then Accept.*

Step Three: Fill out the Dialog

Now that you have *Accepted* the location for the weld and the symbol, the macro will open up the **Select Weld** dialog (Figure 2-113).

Select Weld

Near Side	Far Side
<input type="radio"/> Fillet	<input type="radio"/> Fillet
<input type="radio"/> Square	<input type="radio"/> Square
<input type="radio"/> V-Groove	<input type="radio"/> V-Groove
<input type="radio"/> Bevel	<input type="radio"/> Bevel
<input type="radio"/> U	<input type="radio"/> U
<input type="radio"/> J	<input type="radio"/> J
<input type="radio"/> Flare V	<input type="radio"/> Flare V
<input type="radio"/> Flare Bevel	<input type="radio"/> Flare Bevel
<input type="radio"/> Backer	<input type="radio"/> Backer
<input checked="" type="radio"/> None	<input checked="" type="radio"/> None
<input type="checkbox"/> Size: 8 mm	<input type="checkbox"/> Size: 8 mm

☐ Field Weld ☐ All Around
☐ Tail Note: typ.
☐ Label: @
 Length Spacing

Direction

☒ Left of Arrow -->
☐ <--Right of Arrow

Contour

Near Side	Far Side
<input checked="" type="radio"/> None	<input checked="" type="radio"/> None
<input type="radio"/> Flush	<input type="radio"/> Flush
<input type="radio"/> Convex	<input type="radio"/> Convex

OK Cancel

Figure 2-113: Select Weld

Weld Type

At the top of the dialog, you can select a **Near Side** and a **Far Side** weld. **Near Side** symbols will be placed under the line, **Far Side** symbols above the line. The various kinds of symbols are illustrated in Figure 2-114.

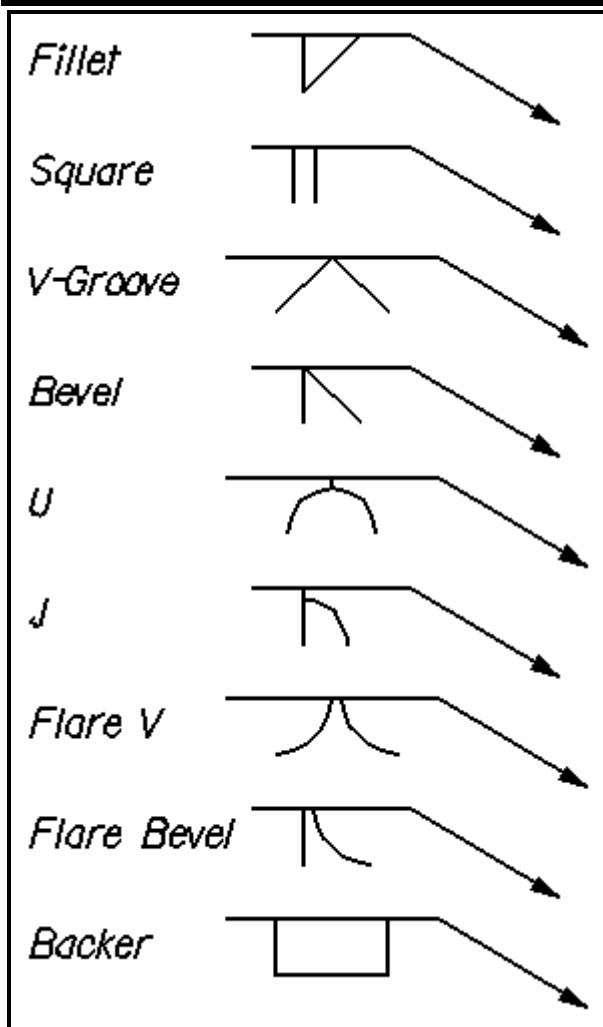


Figure 2-114: Weld Symbols

Choose whatever **Near Side** and **Far Side** welds you would like to show by **Toggling** the button next to the symbol type (Figure 2-115).

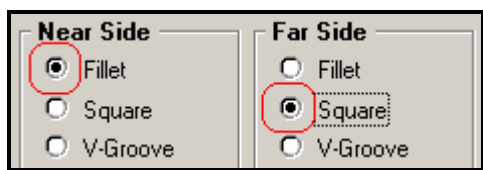


Figure 2-115: Pick Weld Type

♪ If you accidentally pick a weld type for the **Far Side** when you actually don't want to show a **Far Side** weld, pick **None** from bottom of the **Select Weld Dialog**.

Weld Size

Also in the **Near** and **Far Side** boxes you can make your **Size** selection (Figure 2-116).

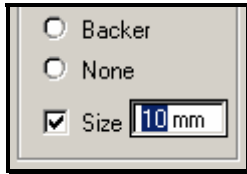


Figure 2-116: Weld Size

Place a **Check** in the box and type a size into the text field.

Field Weld, All Around, Notes, Labeling

Directly under the **Near Side** and **Far Side** boxes, you'll find more weld placement options (Figure 2-117).

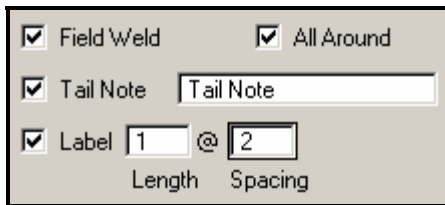


Figure 2-117: Weld Options

These options are illustrated by Figure 2-118.

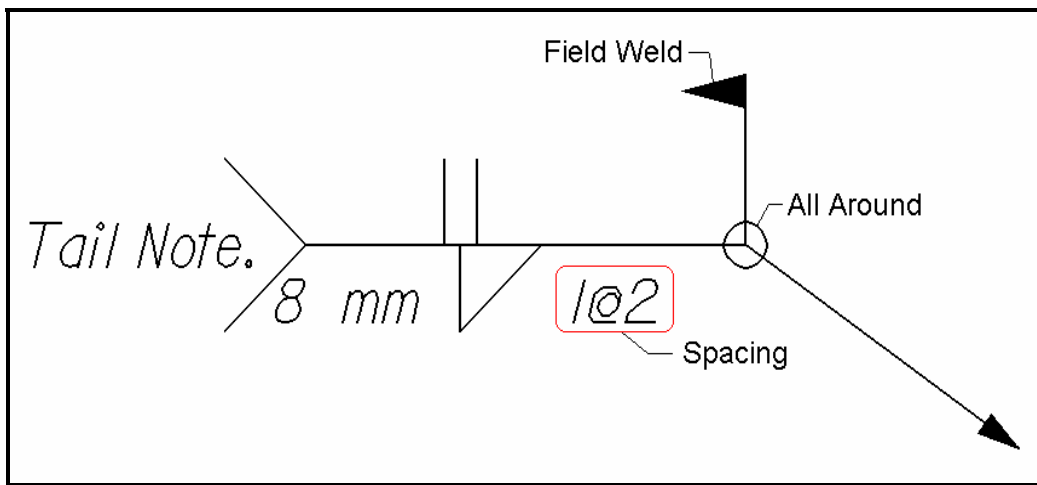


Figure 2-118: Weld Anatomy

Place **Checks** in the appropriate boxes to enable or disable these features and provide text in the text boxes.

Direction

The **Weld** macro is capable of automatically deciding whether the weld symbol should extend to the left or to the right of the arrow. If you want to override the default settings, select a **Direction** from the **Direction Box** (Figure 2-119).

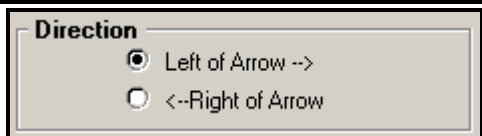


Figure 2-119: Weld Direction

Contour

Near the bottom of the **Select Weld Dialog** there is a **Contour Box** (Figure 2-120).

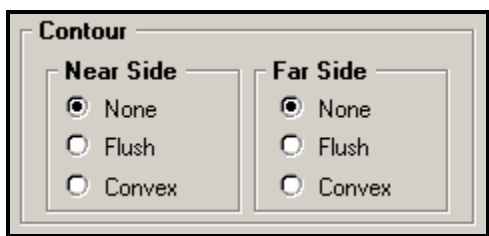


Figure 2-120: Weld Contour

The two options, **Flush** and **Convex** are illustrated in Figure 2-121 on a **Square** weld.

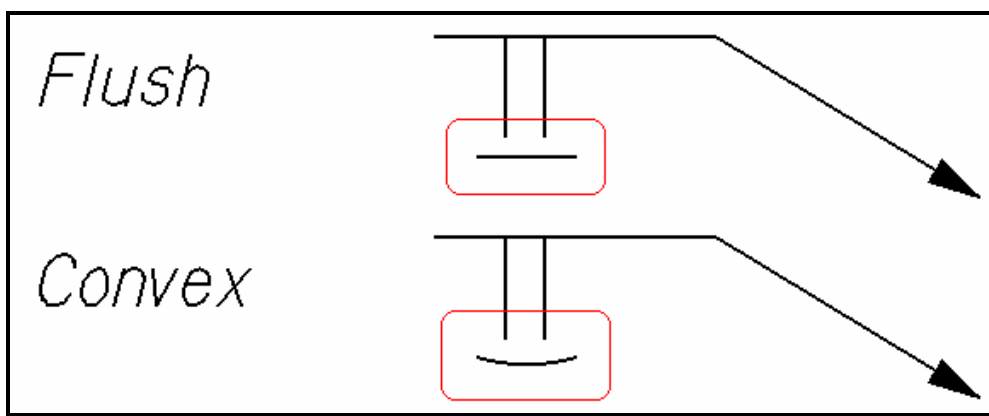


Figure 2-121: Weld Contour Appearance

Step Four: Apply Settings

Press the **OK** button to let the macro draw your weld. Or press **Cancel** to abort the symbol.

Undo It

Similar to the **Steel Macro**, the **Weld Macro** sets a *Mark* before it begins to draw. If you want to *Undo* the creation of a **Weld** symbol, simply choose **Edit > Undo Other > To Mark** from your main menu.

MOVE FILLED SHAPES BACK

Launch the Macro

From your menu, select **Macros > Send Fill Back**.

What Does it Do?

This Macro re-orders the display of elements. It selects all non-filled elements and uses a simple command to re-write them to the end of the design file. This makes them "newer" than the filled elements. New elements display on top of old elements. So by making all non-filled elements "new", we move the filled elements to the "back" of the picture.